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ILLUSTRATIONS

OF THE

GENUS CAREX.

BY

FRANCIS BOOTT, M.D.,

TREASURER OF THE LINNEAN SOCIETY.

PART SECOND.

TAB. 201-310.

~~~~~  
"The men, who labour and digest things most,  
Will be much apter to despair than boast."

ROSCOMMON.



LONDON:

WILLIAM PAMPLIN, 45, FRITH STREET, SOHO.

1860.



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# ILLUSTRATIONS

## OF

# THE GENUS CAREX.

### PART II.

188. *C. cruenta* (Nees); spicis 4–5 pedunculatis remotis oblongo-cylindricis, terminalibus 1–3 masculis fusco-ferrugineis nutantibus, reliquis fœmineis atro-purpureis crassis basi attenuatis longe exserte pedunculatis pendulis, infima rarius basi composita; bracteis inferioribus foliaceis vaginatis pedunculo brevioribus; stigmatibus 3; perigyniis ovato-vel ovali-lanceolatis rostratis bifidis superne margine plus minus serratis enerviis atrosanguineis basi albidis superne tenuissime granulatis membranaceis, squama lanceolata acuminata acuta hispidio-aristata atro-purpurea, nervo pallidiore latioribus longioribusque.—*C. cruenta*, *Nees, apud Wight*, 128; *Kunth*, 463. (TAB. CCI.)

HAB. In Himalaya et Tibetia temperata et alpina, Kashmir, et Kishtwar, alt. 8–10,000 ped., *Dr. Thomson, Jacquemont*. Kumaon et Garhwal, *Wallich*, n. 3389. Kunawur, *Munro*, n. 2435, alt. 15–17,000 ped. Gugi, *Strachey et Winterbottom*, alt. 15,500 ped. Sikkim, *J. D. Hooker*, alt. 13,000 ped.

*Radix* fibris junioribus lanuginosis. *Culmus* 1½-pedalis, lævis, inferne foliatus; pars spicas gerens 6–14 poll. longa. *Folia* 2–4 lin. lata, culmo multum breviora. *Bracteæ* inferiores vaginatae, foliaceae, pedunculis breviores: superiores squamæformes. *Vagina* infima 1½–2 poll. longa. *Pedunculi* setacci, scabri, superne contorti: infimus sæpe 4–5 poll. longus; interdum superne bracteolâ squamæformi, paulo infra apicem sita, munitus. *Spica mascula* 7–11 lin. longæ, 1–2 lin. latæ, pedunculatæ, bracteolatæ, nutantes, 1–2, rarius 3, una alterave sæpe abortiva, bracteola squamæformis sterilis solum exposita. *Spica fœminea* 2–3, plerumque simplices, vel infima rarius spicula minori basi aucta, 8–16 lin. longæ, 4–6 lin. latæ, a se 3–5 poll. remotæ, atro-purpureæ, concoloris. *Squamæ* conformes. *Perigynium* 2 $\frac{7}{10}$ –3 $\frac{1}{10}$  lin. longum,  $\frac{8}{10}$ –1 lin. latum, nervis 2 marginalibus sæpe viridibus, tenuissimum, inferne (ubi achenium tegens) compresso-trigonum, superne complanatum; rostri lacinia obtusæ vel subulatæ; ore subobliquo, (sub lente) ciliato; rarius glabrum. *Achenium* (cum stipite ½ lin. longo) 1 $\frac{4}{10}$  lin. longum,  $\frac{3}{10}$  lin. latum, ellipticum, triquetrum, pallidum.

A *C. ustulata*, Wahl., differt inflorescentia longiori; spicis

masculis pluribus, fœmineis longioribus, remotis; perigyniis longius rostratis; achenio longe stipitato; squamis omnibus aristatis.

Magis ad *C. frigidam*, All., accedit. Differt spicis masculis pluribus, squamis aristatis.

The specimens from Herb. Wallich (Tab. CCI.), on which *C. cruenta* was founded by Nees, are fully mature, and all have simple spikes, with a rudimentary bracteola occasionally on the peduncle, showing a tendency to composition. The male spikes are pedunculate, and more contracted from the absence of anthers which have fallen, and the consequent closer imbrication of the squamæ. On one specimen only, from Munro, is the lower spike compound, and in one from Jacquemont (Tab. CCII. No. 1) the terminal spikes are male at base, all simple. In some young specimens from Dr. Thomson and Dr. Hooker the squamæ are often muticæ (probably from age), but the longer and more remote spikes distinguish them from *C. ustulata*. A slight emargination of the squamæ is occasionally perceptible in Wallich's specimens.

Var. *β. major*; spicis 6–9, terminalibus contiguis sessilibus, 3–4 omnino masculis, vel 3–5 basi masculis, una alterave sæpe apice vel basi vel medio mascula, inferioribus pedunculatis, reliquis 2–4 fœmineis, omnibus vel inferioribus vel infima solum basi spiculis 1–2 compositis; perigyniis plus minus margine serratis, squamis interdum subemarginatis breve aristatis vel muticis, foliis bracteisque subinde latioribus. (TAB. CCII. No. 2, and TAB. CCIII.)

HAB. Kishungunga, Gugi, *Strachey et Winterbottom*, n. 106 (Tab. CCII., No. 2). Kishtwar, *Dr. Thomson*, alt. 8–10,000 ped. (Tab. CCIII.).

These specimens are young. Besides the sessile terminal spikes, the variation in the distribution of the male florets (in which they resemble *C. ustulata*), the occasional emarginate squamæ, the longer inflorescence, and broader leaves and bracts, I see no essential character separating them from the typical form. More fully mature specimens would probably exhibit a longer arista to the squamæ.

189. *C. Koestlini* (Hochstetter); spica maxima supradecomposita (ambitu lanceolato vel oblongo) straminea vel ferruginea, e spiculis androgynis apice masculis co-



piosissimis confluentibus, in ramis decompositis sessilibus congestis vel inferioribus subdiscretis dispositis; bracteis e basi ovata dilatata pallida plus minus longe setaceo-elongatis, infima sæpe spicam superante; stigmatibus 2; perigyniis ovato-vel ovali-lanceolatis basi cuneatis compressis sensim in rostro elongato attenuatis, ore hyalino antice alte secto demum bifido (laciniis acutis), plano-convexiusculis pallide castaneis, marginibus superne alatis serrulatis pallidioribus utrinque leviter nervatis, squamam lanceolatam acuminatam acutissimam membranaceam hyalinam castaneo tinctam æquantibus.—C. Koestlini, *Hochst. in Un. Itin.* 1842, n. 1244; *Stuedel, Syn. Pl. Cyp.* 193 (1855). (TAB. CCIV., CCV.)

HAB. In Abyssinia, prope Demergui, inter lapides ad rivulos, alt. 10,500–11,000 ped., *Schimper, n.* 1036, 1037, 66.

*Radix* fibris lignosis validis, lateritiis. *Culmus* 3-pedalis, triqueter, validus, rigidus, scaber, basi foliosus. *Folia* 5 lin. lata, culmo longiora, carinata, inferne carinato-plicata, rigida, in apice longo acutissimo triquetro attenuata. *Bractea* ligulis elongatis marginalibus præditæ: basis earum ovata, pallida, nervata, ad ramos conspicua: infima sæpe pedalis. *Spica*, in speciminibus magis evolutis, maxima, 6 poll. longa, subpollicem lata, in aliis minor oblonga. *Squamæ* conformes. *Perigynium* 3–3 $\frac{2}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, postice sæpe obscure nervatum; ore e membrana interjecta primum integro, antice alte secto, demum bifido; laciniæ longæ, graciles, acutæ, parallelæ. *Achenium*  $\frac{9}{10}$  lin. longum,  $\frac{4}{10}$ – $\frac{5}{10}$  lin. latum, oblongum, plano-convexiusculum, basi styli crassiore apiculatum.

Var.  $\beta$ . *minor*; spica breviori plus minus crassa conferta vel laxa; culmo gracili; foliis angustis; perigyniis brevioribus latioribus basi spongiosis, squamis ovatis subobtusis latioribus vel lanceolatis acuminatis acutis angustioribus, subinde sordide ferrugineis concoloribus. (TAB. CCVI., CCVII.)

HAB. Prope Demerki et Debreski, ad rivulos; alt. 9000–10,500 ped., *Schimper, n.* 170.

*C. Koestlini* variat spicæ magnitudine et colore; culmi robore; foliorum latitudine, rigiditate; bractearum longitudine; squamis lineari-lanceolatis, acuminatis, acutissimis vel ovatis, subobtusis, pallide castaneis, læte vel sordide ferrugineis; perigynii longitudine, latitudine; et nervatione plus minus valida et copiosa; marginibusque basi acutis vel obtusis, spongiosis, turgidis; ore plus minus bifido; laciniis longis, linearibus, vel brevibus, latioribus; radix semper fibris colore lateritiis prædita.

I am indebted to M. Spach for the opportunity of examining an extensive suite of specimens of this fine species, all collected by Schimper, and am confirmed in the opinion that they are all referable to one and the same species by M. Spach, who says, in a letter to me:—"J'ai examiné *C. Koestlini* et ses variétés, en m'aidant de vos notes, et mes recherches aboutissent à me faire participer à votre propre opinion, et même à ne conserver aucun doute sur l'identité spécifique de toutes ces formes qui de prime abord sembleraient constituer des espèces distinctes. La forme type (Tab. CCV.), qui a des périgynes fort nervurés, comme la forme *minor*, mais sans fongosité, établit, il me semble, le passage entre le *major* et *minor*. Du reste, j'ai trouvé la forme des périgynes excessivement variable dans tous les échantillons, et je n'ai pas vu que la déposition de la matière fongueuse influât en rien sur cette polymorphie, car dès l'époque de la floraison et lorsque le périgyne est encore parfaitement membraneux, il offre, sauf les dimensions, la forme qu'on lui retrouve à la maturité."

The deposition of spongy matter in perigynia is not constant in

one and the same spike. It is the effect of complete maturation, and always more or less influences the form.

Richard has not included this species in his *Fl. Abyssinica*. The original specimens distributed by the Un. Itin. were like Tab. CCV., one of which I have, through the kindness of my late friend Dr. Charles Lemann.

190. *C. conferta* (Hochstetter); spica oblonga ferruginea subduplicato-composita, e spiculis 10–12 androgynis apice masculis, superioribus ovatis simplicibus sessilibus confertis, inferioribus compositis brevi-pedunculatis discretis; bractea angusta spicâ longiore vel obsoleta auriculata; stigmatibus 2; perigyniis ovatis rostratis, ore antice altius secto bidentato, plano-convexis superne margine serratis antice 3–4 postice nisi basi obsolete nervatis pallidis, squamam late ovatam acutam ferrugineam nervo viridi subæquantibus.—*C. conferta*, *Hochst. in Un. Itin.* n. 576 (1842); *Richard, Fl. Abyssin.* ii. 512. (TAB. CCVIII.)

HAB. In Abyssinia, prope Debreski, in pratis, alt. 9300 ped., *Schimper, n.* 931.

*Rhizoma* lignosum, longe repens. *Culmus* 2–2 $\frac{1}{2}$ -ped., acute triqueter, scaber, nudus, subdebilis, basi foliatus. *Folia* 2–3 lin. lata, culmo longiora, plana, graminea, glauca. *Bractea* auriculatæ, sæpe obsoletæ. *Auriculæ* subrotundæ, ferrugineæ. *Spica* 1 $\frac{1}{2}$ –2 poll. longa, 4–8 lin. lata: spiculæ ovatæ, apice parce masculæ. *Squamæ* conformes. *Perigynium* 1 $\frac{6}{10}$ – $\frac{8}{10}$  lin. longum,  $\frac{7}{10}$ – $\frac{8}{10}$  lin. latum, antice medio 3–4-nervatum, pallidum, apice ferrugineum. *Achenium*  $\frac{7}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, plano-convexum, stipitatum, basi styli clavata apiculatum.

A *C. vulpina* differt rhizomate repente, spiculis inferioribus pedunculatis, perigyniis brevioribus, squamis muticis.

191. *C. Bonariensis* (Desfontaines); spica oblonga flavescens-ferruginea, e spiculis pluribus androgynis, apice masculis, sublaxe glomeratis, glomerulis inferioribus longe bracteatis; stigmatibus 2; perigyniis ovatis sensim rostratis superne margine serratis, ore antice fisso bidentato, plano-convexis utrinque insigniter medio tuberculatis basi spongiosis antice ad latera gibbosis postice foveolatis leviter nervatis stipitatis, squama ovata acuta mucronata ferruginea longioribus.—*C. Bonariensis*, *Desf. in Poir. Ency. Suppl.* iii. 250 (1813); *Gay, Ann. Sc. Nat.* x. 300 (1838: *excl. syn. Schlecht. et Kunth*). *C. vulpina* (papillosa), *Nees in Hooker Journ. Bot.* ii. 398 (1840). *C. tuberculata*, *Nees in Herb. Lindley.* (TAB. CCIX.)

HAB. In America australi. Montevideo, *Commerson, Isabelle*. Buenos Ayres, *Commerson, Tweedie*. Mendoza, *Gillies (Herb. Hooker)*.

*Radix* fibrosa. *Culmus* 9–12-poll., gracilis, obtusangulus, lævis. *Folia* sublineam lata, culmo breviora. *Bractea* inferiores, 2–3, foliaceæ, spicam plus minus longe superantes: infima angusta, subinde 5 poll. longa. *Spica*  $\frac{1}{2}$ –1 $\frac{1}{2}$  poll. longa, 3–5 lin. lata. *Squamæ* conformes, masculæ angustiores. *Stamina* 2. *Perigynium* 2–2 $\frac{3}{10}$  lin. longum,  $\frac{8}{10}$ –1 $\frac{1}{10}$  lin. latum, flavide ferrugineum. *Achenium* 1 lin. longum,  $\frac{8}{10}$  lin. latum, subrotundo-ovatum, plano-convexiusculum, basi styli decidua crassiore.

The singular tuberculation of the perigynia separates this species from its allies, and is entirely wanting in the plant described by Schlechtendal and Kunth, which I refer to the next species.

192. *C. involucrata* (Boott); spica ovato-subrotunda



capitata straminea involucrata, e spiculis 3–6 ovatis androgynis apice masculis arcte congestis, inferioribus 1–2 longe bracteatis; bracteis erectis; stigmatibus 2; perigyniis late ovatis vel suborbiculatis rostratis bidentatis plano-convexis marginibus acutis superne subalatis serrulatis antice obsolete vel leviter postice plerumque basi nervatis breve stipitatis stramineis rostro ferrugineo membranaceis, squama ovata acuta vel cuspidata margine scariosa paulo longioribus.—*C. involucrata*, Boott. *C. Bonariensis*, Schlecht. in *Linnaea*, x. 116; Kunth, 378 (non Desf.). (TAB. CCX.)

HAB. In America australi, Gillies (*Herb. Hooker*).

*Culmus* subpedalis, gracilis, lævis. *Folia* 1 lin. lata, culmo breviora. *Bractea* infima 1–1½-poll., altera spica paulo longior. *Spica* 6–9 lin. longa et lata. *Perigynium* 1– $\frac{6}{10}$ – $\frac{8}{10}$  lin. longum,  $\frac{8}{10}$ –1 lin. latum. *Achenium*  $\frac{6}{10}$ – $\frac{8}{10}$  lin. longum et latum, orbiculatum, plano-convexum, basi styli clavata.

Affinis *C. cephalophoræ*, Muhl., quæ differt culmo scabro; foliis longioribus et latioribus; bracteis setaceis, reflexis; perigyniis bifidis; squamis longe aristatis.

193. *C. Franklinii* (Boott); spicis 6–10 rubro-ferrugineis, superioribus congestis sessilibus inæqualibus, terminali ovata apice mascula, proximis linearibus masculis vel basi parce foemineis, reliquis ellipticis utrinque acutis remotis exserte pedunculatis nutantibus sæpe omnino foemineis, infima interdum composita; bracteis inferioribus angustis vaginatis culmo brevioribus; stigmatibus 3 vel 2; perigyniis ellipticis vel ovatis vel fusiformibus plano-trigonis vel compressis plus minus rostratis, ore hyalino emarginato fimbriato oblique fisso, nervatis superne scabriusculis margine serrulatis membranaceis, squama ovata acuta mucronulata vel subobtusa dorso puberula margine hyalina longioribus.—*C. Franklinii*, Boott; *Hooker. Fl. Bor. Am.* 217. t. 218. (TAB. CCXI.)

HAB. In America septentrionali. Rocky Mountains, Drummond.

*Culmus* 2–3-pedalis, inferne obtusangulus, lævis, superne scabriusculus, strictus, rigidus, nudus basi foliatus vaginisque ferrugineis laceratis tectus; pars spicas gerens 3–5 poll. longa. *Folia* latitudine varia, plana, lineam lata, vel involuta vel setacea, apice attenuata, firma, elongata, culmo breviora. *Bractea* inferiores angusta, vaginatae, sursum obsolete. *Vagina* infima 3–4 lin. longa. *Pedunculi* 2 lin. ad 2 poll. longi, setacei, scabri. *Spicae* 5–11 lin. longæ, 1–3 lin. latæ; terminalis apice mascula, ad ejus basin 1–3 sessiles, lineares, masculæ vel basi parce foemineæ; reliquæ ovatae, apice masculæ, vel inferiores ellipticæ, foemineæ, remotæ, exserte pedunculatæ, nutantes. *Squamæ* conformes. *Perigynium* 1– $\frac{7}{10}$ –2 lin. longum,  $\frac{8}{10}$ – $\frac{9}{10}$  lin. latum, ellipticum vel ovatum: vel 2½ lin. longum,  $\frac{6}{10}$ – $\frac{8}{10}$  lin. latum, superne rubro-ferrugineum, scabriusculum, basi pallidum, glabrum, compressum vel plano-trigonum, nervatum, membranaceum. *Achenium* (cum stipite  $\frac{2}{10}$  lin. longo) 1 lin. longum,  $\frac{5}{10}$ – $\frac{6}{10}$  lin. latum, triquetrum vel plano-convexiusculum, ferrugineum, basi styli puberuli apiculatum.

I have not seen any specimens of this plant but those brought by Drummond. In the *Flora Bor. Americana* I quoted as a synonym the *C. ovata* of Dewey and Torrey. On referring, however, to their notice of that species, I find that neither of them had seen it. Dewey erroneously describes its spikes as *apice masculæ*, and this either misled me or I found the specimens of *C. Franklinii* in *Herb. Hooker* named *C. ovata* by them. Dewey has not included this species in his reports in Silliman's *Journal*. Its affinity is with the *Ferrugineæ*, with species of which group Drejer

has placed it in his first table of affinities. In that table there are some corrections to be made. The *C. asperula*, Nees, is his *C. psychrophila*; and the *C. ovata*, Rudge, and *C. Caucasica*, Stev., are perhaps only varieties of *C. atrata*, L. *C. nigritella*, Drejer, is the *C. stylosa*, Meyer; and *C. arctica*, Dewey, is *C. Parryana*, Dewey. *C. misandra*, Br., is *C. fuliginosa*, St. and Hop.

194. *C. fuliginosa* (Sternberg et Hoppe); spicis 2–5 rarius 6 obovatis vel ellipticis atro-purpureis, terminalibus 1–2 basi masculis subsessilibus, reliquis foemineis remotis exserte pedunculatis nutantibus, infima rarius radicali; bracteis superioribus squamæformibus inferioribus vaginatis brachyphyllis; stigmatibus 3–2; perigyniis lanceolatis plano-trigonis vel compressis rostratis, ore albo-hyalino oblique fisso demum bifido vel bilobato, superne margine serratis enerviis atro-purpureis basi albidis membranaceis, squama ovata obtusa vel subacuta atro-vel læte purpurea margine albida angustioribus longioribusque.—*C. fuliginosa*, Sternb. et Hopp. *Act. Soc. Bot. Ratisbon*, i. 159. t. 3; Hopp. et Sturm, *Car. Germ. Icon.*; Kunze, 57. t. 14; Anderson, 26. t. 7. f. 90; Drejer, *Rev. Crit.* 54; Lang, 116; Franklin, *Nar. App.* 763 (1823); Koch, 881; Dewey, xi. 152; Torr. *Mon.* 407. *C. frigida*, Wahl. *Fl. Succ.*! *C. misandra*, Brown, Parry, *Voy. Suppl.* 283, 309; Torr. *Mon.* 325. *C. fuliginosa*,  $\beta$ , Lang, 117. (TAB. CCXII.)

HAB. In Europa, Asia, et America arctica. Lapland to the alps of Germany. Behring's Straits, Wright. Greenland, Wahl. Arctic seacoast of North America, Ross, Parry, Franklin, Sir John Richardson.

*Radix* fibrosa. *Culmus* 3–12-poll., gracilis, lævis, apice setaceus, nutans, basi foliatus vaginisque pallide ferrugineis tectus; pars spicas gerens 1–5 poll. longa. *Folia* plana, 1 lin. lata, vel involuta; in speciminibus altioribus vix partem tertiam inferiorem culmi attingentia. *Bractea* superiores squamæformes, purpureæ: inferiores vaginatæ, pedunculo breviores; vel infima foliacea, spiculam æquans. *Vagina* infima 2–11 lin. longa: omnes plus minus purpurascentes. *Pedunculi* inferiores ½–2½ poll. longi, setacei, scabri. *Spicae* plerumque 3–5, obovatæ vel ellipticæ, 4–9 lin. longæ, 2–3 lin. latæ, subinde omnes basi masculæ. *Squamæ* conformes. *Perigynium* 2– $\frac{4}{10}$  lin. longum, ½ lin. latum, superne vacuum; ore albo-hyalino, antice altius fisso, subintegro, vel demum emarginato vel bifido vel bilobo; inferne plano-trigonum vel compressum. *Achenium* breve stipitatum,  $\frac{8}{10}$  lin. longum, ½ lin. latum, oblongum vel obovatum, trigonum vel (stigmatibus 2) angulo antico obsoleto: rarius racheolâ  $\frac{2}{10}$  lin. longâ instructum.

A *C. frigida*, All., differt radice fibrosa, omnibus partibus gracilioribus; spicis minoribus, superioribus, rarius omnibus, basi masculis, pedunculatis; bracteis brevioribus; perigyniis ore albo hyalino; foliis brevioribus.

Anderson says of this species, "Synonyma difficillime extricanda." I have quoted only two, that of *C. misandra*, Brown, and *C. frigida*, Wahl., for both of which I have authentic specimens. I do not quote Schkuhr, C. C. fig. 47, for the figure is certainly not characteristic, and Willdenow and Reichenbach refer it to *C. frigida*, All. Nor do I quote Reichenbach's figure, for, as Anderson says, he has misapplied the names; his *C. fuliginosa*, t. 249, being *C. frigida*, All., and his *C. frigida*, t. 250, being the *C. fuliginosa*, St. and Hop., but not very good. Brown, in his original description of *C. misandra*, alludes to an umbelliferous arrangement in the inflorescence. It is observable occasionally in imperfectly developed specimens, two or three spikes apparently proceeding from one of the upper squamæform bracts. The specimens figured in Tab. CCXII. were from the seacoast of Arctic America,



collected by Sir John Richardson. Ledebour does not include this species in his *Fl. Altaica*, nor have I seen it from the Himalaya. Dr. Gray kindly sent me specimens found by Wright in Arakam-tetchene Island, in Behring's Straits. It was found by all the Arctic travellers and voyagers in America.

Lang considers *C. misandra*, Br., a var. *minor*, and he and Drejer (Rev. p. 54) describe the perigynium "ore albo, non margine albo cincto," as in the European plant, but in specimens from the Alps of Carinthia I observe both characteristics.

195. *C. laxa* (Wahlenberg); spicis 2-3 oblongis remotis ferrugineis, terminali mascula, rarius apice vel basi mascula, reliquis foemineis laxifloris exserte pedunculatis pendulis, infima subinde radicali; bracteis vaginatis, culmo multum brevioribus; stigmatibus 3; perigyniis ellipticis rostellatis, ore integro ferrugineo, obscure nervatis papillois glaucis, squama obtusa vel acuta mutica vel mucronulata ferruginea, nervo pallido angustioribus brevioribus vel subaequantibus.—*C. laxa*, *Wahl. Act.* 156; *Fl. Lap.* 237. t. 15. f. 1; *Willd.* 294; *Schk.* 79 (*excl. f. A.A.A. quæ C. rariflora*); *Kunth*, 461; *Fries Summa*, 236; *Lang*, 92; *Anderson*, 36. t. 6. f. 69; *Ledebour, Fl. Ross.* iv. 297. (TAB. CCXIII.)

HAB. In Lapponia et Rossia.

*Radix* stolonifera, fibris glabris. *Culmus* subpedalis, gracilis, acutangulus, lævis, flaccidus vel firmus; pars spicas gerens 3-10 poll. longa. *Folia* sublineam lata, plana vel conduplicata, culmo multum breviora. *Bractea* vaginata: infima solum spicula longior. *Vagina* infima sæpe pollicaris. *Pedunculi* setacei, læves: infimus  $1\frac{1}{2}$ -5 poll. longus. *Spica mascula* 5-7 lin. longa, 1 lin. lata, erecta. *Spicae foemineae* 2-7 lin. longæ, 2 lin. latæ, glauco-ferrugineæ, a se 2-6 poll. remotæ: summa sæpe abbreviata, pauciflora, nunc masculæ contigua: infima sæpe radicalis. *Squamæ* conformes, masculæ longiores. *Perigynium*  $1\frac{3}{10}$ - $2\frac{2}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, oblongum vel ovale, sæpius ellipticum, interdum erostellatum vel repente rostellatum; ore integro vel subemarginato, rectum vel subexcurvum; nervis inconspicuis. *Achenium*  $\frac{3}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, obovatum, triquetrum, basi styli apiculatum.

All authors admit the resemblance of this rare species to *C. limosa* and its affinity to *C. panicea*. The vaginate bracts and smooth rootlets place it in the *Paniceæ*. I have only seen Lapland specimens. M. Spach informs me that in twenty-five specimens from Læstadius, in the Herb. Mus. Paris, nine had one female spike and the others two; in four the lower one was radical. There is occasionally a sterile squamæform bract intermediate between the male and the proximate female spike. Lang says, "Mirum est quod botanici nullum de pube seu tomento tenuissimo fructuum verbum faciunt, qua ratione *C. laxa* ab affinibus optime distinguitur." He alludes to the papillæ or granulations which are common to the *Paniceæ*. Lang places it with the *Limosæ*.

196. *C. livida* (Willdenow); spicis 2-3 rarius 4 oblongis erectis, terminali mascula, foemineis 1-3, superioribus vel omnibus approximatis, inferioribus breve vaginatis infima sæpe radicali longissime pedunculata; bracteis vaginatis vel amplexantibus plerumque culmo brevioribus; stigmatibus 3; perigyniis ovatis basi plus minus acutis obtuse triquetris superne vacuis brevissime vel vix rostellatis, glaucis concoloribus vel ore integro ferrugineo, plus minus nervatis, nervis sæpe obscuris, granulatis, squama oblongo-ovata obtusa mutica vel mucronata purpureo-sanguinea medio pallida margine hyalina longioribus vel subaequantibus.—*C. livida*, *Willd.* 285; *Schk.* f. 211; *Wahl. Fl. Lap.* 236; *Kunth*, 460; *Fries, Sum.* 236; *An-*

*derson*, 34. t. 7. f. 74; *Lang*, 94; *Boott, Fl. Bor. Am.* 224; *Carey*, 520; *Tor. Mon.* 417; *Gray, Ann. Lyc. N. York*, iii. 235 (1835); *Sartwell, Exc. n.* 66. *C. limosa*,  $\delta$ , livida, *Wahl. Act.* 162 (1803). *C. Grayana*, *Dewey*, xxv. 141; *Steudel*, ii. 227. (TAB. CCXIV., CCXV.)

HAB. In Europa et America septentrionali. Lapland, Sweden, Norway, Hudson's Bay, Cumberland and Carlton House, North-west Coast. New Jersey and New York, in peat-bogs.

*Radix* fibrosa, fibris glabris, stolonifera. *Culmus* 4-12-poll., gracilis, obtusangulus, lævis vel superne acutangulus, scabriusculus. *Folia*  $1-1\frac{1}{2}$  lin. lata, culmo breviora, firma, stricta, glauca, basi conduplicata, carinata. *Bractea* vaginata vel amplexantes, culmo breviores vel infima eo paulo longior. *Vagina* 2-4 lin. lata. *Pedunculus* infimus  $\frac{1}{2}$ -8-10 poll. longus. *Spica mascula* 5-10 lin. longa,  $1-1\frac{1}{2}$  lin. lata. *Spicae foemineae* 4-8 lin. longæ,  $2-2\frac{1}{2}$  lin. latæ. *Squamæ masculæ* purpureæ, margine albidæ, obtusæ; nervo, nisi in superioribus, infra apicem evanescente: foemineæ sæpe pallidiores, muticæ vel mucronatæ. *Perigynium* (in speciminibus Europæis et Americanis)  $1\frac{7}{10}$ - $2\frac{1}{10}$  lin. longum,  $\frac{7}{10}$ - $\frac{9}{10}$  lin. latum, ovatum vel ovato-ellipticum, basi plus minus acutum, semper obtuse trigonum, *latius* plus, vel *angustius* minus, turgidum, nervis concoloribus pellucidis sæpe obscuris: interdum apice subexcurvum. *Achenium*  $1\frac{1}{10}$ - $\frac{3}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, triquetrum, ovale, tenuissime punctulatum, basi styli crassiore apiculatum, pallidum vel castaneum.

The Lapland specimens (Tab. CCXIV.) of this species and the American ones from New Jersey (Tab. CCXV.) exhibit the extremes of its variation. Swedish specimens are like the American plant, while those from Arctic America and the Rocky Mountains resemble those from Lapland. Anderson says, "Lapponiæ quum inhabitat paludes, spicas, ob squamas valde fusco-marginatas, habet discolores, quo magis autem austrum versus Sueciæ mediæ loca uliginosa occupat, eo pallidior evadit planta."

The Lapland plant has often a shorter culm, though Wahlenberg, in his 'Flora Lapponica' (p. 237) describes it as "plerumque pedalis," the spikes are often approximate, with fewer and lax flowers, and the squamæ are of a darker colour. The perigynia, however, are always trigonous, not "compressa lenticularis" (*Anderson*), nor "planiuscula" (*Wahlenberg*), nor "enervia, angulis carentia" (*Flora Rossica*). The only compressed portion is the upper part above the achenium.

The New Jersey plant has generally a tall culm, which has obtuse angles at the base, the spikes longer and more remote; the male scales, always coloured, often without a mucro; the female ones generally paler; and the achenium with less distinct punctulations.

But these distinctions are not constant, and M. Spach in a note says, "Specimen Friesianum *C. lividæ*, in Herb. Boott, omnino congruum speciminibus Americanis." In the American plant the female spikes are occasionally abortive. Like *C. laxa*, this species belongs to the *Paniceæ*.

197. *C. limosa* (L.); spicis 2-3 læte vel fusco-ferrugineis, terminali mascula erecta oblonga vel cylindrica pedunculata, foemineis 1-2 ovatis vel oblongis sæpe apice masculis pendulis; bracteis angustis, culmo brevioribus, auricula ferruginea amplexante vel brevissime vaginante; stigmatibus 3; perigyniis ovatis vel ellipticis compresso-trigonis obscure nervatis glaucis papillois rostellatis, ore integro vel emarginato, squama ovata obtusa mucronata vel acuminata subaequilata fusca vel rutilante, nervo sæpe concolori longioribus vel brevioribus.—*C. limosa*, *L. Sp. Pl.* (1763); *Good. Lin. Trs.* ii. 187; *Willd.* 293; *Schk.* f. 78; *Gaud. Agrost.* 157; *Wall. Fl. Lap.* 242; *Smith*,



*Eng. Fl.* 102; *Eng. Bot. t.* 2043; *Kunth*, 461; *Drejer, Rev.* 51; *Lang*, 91; *Anderson*, 36. *t.* 7. *f.* 73; *Reich.* 17. *t.* 238; *Dewey*, x. 41; *Schw. et Tor.* 358 (*excl. C. lenticularis, Mx.*); *Tor. Mon.* 425; *Carey*, 519; *Sartwell, Ees. n.* 60. *C. elegans, Willd. Act. Berol.* 34. *t.* 1. *f.* 4. *C. laxa, Dewey*, xxvi. 376 (*non Wahl.*). (TAB. CCXVI.)

HAB. In Europa, Asia, et America septentrionali, in limosis. Lapland to Switzerland. Arctic America to Pennsylvania. Rocky Mountains, North-west Coast.

*Radix* longe repens, articulata, stolonifera: fibris flavidis, lanosis. *Culmus* 1-1½-pedalis, gracilis, erectus vel obliquus, triquetus, scabriusculus, basi foliatus, rudimentisque foliorum ferrugineis tectus. *Folia* angusta, ¼-¾ lin. lata, culmo multum breviora (*sterilia* eo longiora), viridia, glaucescentia, firma, stricta, carinata. *Bractea* angustissima: summa brevi setacea; infima culmo brevior, auricula ferruginea amplexens vel brevissime vaginans. *Pedunculi* setacei, læves, subpollicares vel breviores, læves, apice clavati, triquetri. *Spica mascula* 6-13 lin. longa, 1-1½ lin. lata, arrecta: squamæ masculæ obtusiusculæ vel acutissimæ, mucronatæ, nervo viridi vel concolori: foemineæ in speciminibus Lapponicis nunc acuminato-cuspidatæ, perigynio longiores. *Spicae foemineæ* 4-10 lin. longæ, 3-4 lin. latæ, sæpe apice masculæ, a se 6-13 lin. remotæ, pendulæ. *Perigynium* 1½-1¾ lin. longum, 1-1½ lin. latum; formâ varians, subrotundum, ovatum vel ellipticum, compresso-trigonum vel trigono-anceps, antice planum vel plus minus convexum: rostello subinde nullo vel brevissimo, cylindrico vel conico: ore integro, interdum obliquo vel acute vel obtuse emarginato. *Achenium* 1 lin. longum, ⅙-⅗ lin. latum, ovale, triquetrum, faciebus superne gibbis, inferne caviusculis, castaneum, basi styli apiculatum, sæpe ustilagine morbidum.

A *C. livida* abunde differt spicis pendulis, sæpe apice masculis; auricula ferruginea brevissime vaginante; foliis angustioribus; fibris lanatis.

A *C. Magellanica* differt spicis apice (nec basi) masculis, paucioribus, etc.

I have never seen the terminal spike androgynous with male flowers at the top, as noticed by Fries. The female spikes, as in *C. livida*, are occasionally abortive. Smith (*Eng. Fl.* p. 102) says, "Root creeping very extensively, sending forth smooth leafy runners deep into the mud, so that the flowers are rarely produced, at least in Norfolk." Lang (p. 92) says, "Spicae foemineæ in *C. limosa* maxima ex parte sunt 2; in *C. irrigua* 3; masculæ in *C. limosa* frequenter 2; in *C. irrigua* semper solitaria." I have never seen two male spikes in *C. limosa*, and no other author has noticed them. As to the number of spikes, I find in 119 specimens of *C. limosa*, from various localities in Europe—

|                             |
|-----------------------------|
| 3 with 1 spike (male only). |
| 78 „ 2                      |
| 38 „ 3                      |
| —                           |
| 119                         |

In 78 American specimens—

|                             |
|-----------------------------|
| 1 with 1 spike (male only). |
| 46 „ 2                      |
| 30 „ 3                      |
| 1 „ 4                       |
| —                           |
| 78                          |

In 76 European specimens of *C. Magellanica*, I find—

|                  |                              |
|------------------|------------------------------|
| 3 with 2 spikes. | 51 with terminal spike male. |
| 42 „ 3           | 25 „ „ male at base.         |
| 30 „ 4           |                              |
| 1 „ 5            |                              |
| —                | —                            |
| 76               | 76                           |

In 62 American specimens of *C. Magellanica*—

|                  |                              |
|------------------|------------------------------|
| 1 with 2 spikes. | 47 with terminal spike male. |
| 26 „ 3           | 15 „ „ male at base.         |
| 33 „ 4           |                              |
| 2 „ 5            |                              |
| —                | —                            |
| 62               | 62                           |

It would appear from the above analysis, that in 197 specimens of *C. limosa* only 68 had two female spikes, while 124 had one. In 138 specimens of *C. Magellanica*, 68 had two and 63 had three female spikes. The specimens figured of *C. limosa* are from Arctic America. The one with unusually long spikes, *C. limosa*, var. *oblonga*,\* Dewey, is from New York, varying from the common American form in the length of its spikes.

198. *C. rariflora* (Smith); spicis 3 rarius 2-4 oblongis, terminali mascula erecta pedunculata fusco-ferruginea, foemineis laxi-paucifloris pendulis piceis approximatis vel infima subremota; bractea infima culmo brevior foliacea vel subulata, auricula purpurea oblonga amplexente vel breve vaginante; stigmatibus 3; perigyniis ellipticis brevissime aut vix rostellatis glaucis, ore integro ferrugineo, subbiconvexis obscure nervatis, squama rotundato-ovata obtusa vel acuta mucronata vel mutica amplexente picea angustioribus brevioribus vel subæquantibus.—*C. rariflora, Smith, Eng. Bot. t.* 2516; *Eng. Fl.* 100; *Anderson, xxxv. t.* 6. *f.* 70; *Lang*, 93; *Drejer, Rev.* 51; *Fries, Sum.* 70. *C. limosa*, var. *rariflora, Wall. Act.* 162; *Fl. Lap.* 242; *Kunth*, 461. *C. stygia*?, var. *rariflora, Fries, Mant. iii.* 142. (TAB. CCXVII.)

HAB. In Europa et America septentrionali. Lapland to the alps of Scotland. Greenland. Canada.

*Radix* repens, stolonifera: fibris longis, flavidis, lanatis. *Culmus* 4-9-poll., erectus, firmus, obtusangulus, lævis, rarius acutangulus, scabriusculus, basi foliatus. *Folia* ½-1¼ lin. lata, culmo breviora, plana, carinata, firma, superne scabra. *Bractea* antice ligula elongata obtusa purpurea apice pallidiore sæpius breve vaginante vel amplexente instructa: infima semper culmo brevior, foliacea, vel subulata, subinde brevissima. *Pedunculi* 3-12 lin. longi, læves, superne clavato-triquestri. *Spica mascula* 3-5 lin. longa, 1 lin. lata: squamis masculis imbricatis, obtusissimis, apiculatis vel acutis, mucronatis, fusco-ferrugineis, demum decoloribus. *Spicae foemineæ* 3-7 lin. longæ, 2-2½ lin. latæ, rarissime apice masculæ: summa subinde brevis, erecta, infima longior: omnes plerumque laxifloræ, rarius subdensifloræ. *Squamæ* foemineæ obvolventes, piceæ: nervo nunc pallidiore. *Perigynium* 1½-1¾ lin. longum, ⅙-⅗ lin. latum, basi attenuatum, spongiosum, biconvexum vel inæqualiter trigonum, obscure nervatum, vel nervis 2 marginalibus prominentibus tenuissime granulatum: *angustius* ellipticum, utrinque acutum, vix rostellatum: vel *latius* ovale vel ovatum, stipitatum, rostellatum: ore integro, purpureo. *Achenium* ⅙-1 lin. longum, ½ lin. latum, oblongum, inæqualiter trigonum, punctulatum, ferrugineum, basi styli apiculatum.

A *C. limosa* differt omnibus partibus (*nisi foliis*) minoribus; culmo plerumque obtusangulo, lævi; spicis pluribus angustis, pauci-laxifloris, rarissime apice masculis; squamis piceis obvolventibus, mucronulatis; foliis planiusculis, parum latioribus; ligula elongata, sæpius vaginante.

In 108 specimens I find—

|                   |                                     |
|-------------------|-------------------------------------|
| 11 with 2 spikes. | The female very rarely male at top. |
| 83 „ 3            | In 2 the lower one was radical.     |
| 14 „ 4            |                                     |

I have not seen this species from the United States, and I should infer that it is not so common in Arctic America as in Europe. M. Spach says, in a note to me, "Ex speciminibus Lapponicis in



Herb. Mus. Paris, a Læstadio missis, alia culmum præbent obtusangulum, alia acutangulum, angulis scabro-serrulatis." I have observed the same variation in Scotch specimens, all in other respects having the size and character of *C. rariflora*. I am not familiar with the *C. stygia* of Fries, which he describes with an acute-angled smooth culm, and he remarks that he had received it from Finmark, under the name of *C. limosa*. In his Mantissa (iii. 142) he was inclined to consider *C. rariflora* as a var.  $\beta$  of *C. stygia*, but in his Summa (p. 71) he admits both as species. Anderson (p. 35), however, makes *C. stygia* a variety of *C. rariflora*. He says of them: "In *C. stygia*, sub *C. rariflora* proponenda, valde fui dubius, et fateor notas e culmo, fructibus spicisque desumptas, quibus quodammodo diversa videntur, sat esse evidentes. Quum autem non tantum habitu toto externo sed etiam characteribus primariis quibus ab affinibus differunt, valde congruant, differentias quas inter se præbent, ex indole stationis bene esse interpretandas crederem. *C. stygia* enim loca inferalpina Norvegiæ, subalpina Lapponiæ et eximie paludosa Rossicæ arcticæ inhabitans, staturam sibi præfert altiore, culmum sursum scabriusculum, spicas paulo majores, nec vero ita a proxima *C. limosa* (vel, si herbam adspicias, *C. irrigua*) diversas, ut rarifloras diceret, fructus denique utrinque æqualiter convexos. *C. rariflora* autem loca summa et irrigata alpium præsertim amans, colorem multo fuscior, culmum magis obtusangulum, herbam minorem, spicasque breviores et magis rarifloras, fructusque ob eam causam subtrigono-vel rotundato-convexos, et rostro paulo evidentiori apiculatos sibi acquirit."

199. *C. Magellanica* (Lamarck); spicis 3-4 rarissime 2-5 glauco-ferrugineis, terminali mascula oblonga basi attenuata ferruginea vel sæpe basi mascula obovata pedunculata, reliquis foemineis, sæpe ima basi masculis subrotundis vel oblongis pendulis approximatis vel infima subremota; bractea infima foliacea culmum superante, auricula elongata amplexante vel breve vaginante; stigmatibus 3; perigyniis orbiculato-obovatis compressis antice medio gibbis obtusis glaucis papillois, ore integro, utrinque plus minus nervatis stipitatis, squama ovato-lanceolata acuminata læte vel fusco-ferruginea medio trinervi sæpe concolori demum decidua latioribus brevioribus.—*C. Magellanica*, *Lam. Encycl.* iii. 385 (1789); *Willd.* 222; *Schk. f.* 51; *Kunth*, 435. *C. irrigua*, *Smith in Hoppe Caricol. Icon.* 92; *Koch*, 875; *Fries, Mant.* iii. 140; *Anderson*, 36. t. 7. f. 72; *Lang*, 90; *Drejer, Rev.* 51; *Reich.* 17. t. 238; *Eng. Bot. t.* 2895; *Carey*, 519; *Sartwell, Ews. n.* 61. *C. limosa*,  $\beta$ , *irrigua*, *Wahl. Act.* 161; *Kunth*, 461; *Dewey*, x. 41; *Tor. Mon.* 425. *C. limosa*,  $\gamma$ , irrigata, *Wahl. Fl. Lap.* 243. t. 15. f. 2. *C. paupercula*, *Mich.* 172. *C. lenticularis*, *Dewey, Sill.* vii. 273. (TAB. CCXVIII., CCXIX., et CCXX.)

HAB. In Europa et America septentrionali et australi. Lapland to Switzerland. Arctic America to Pennsylvania. —Var.  $\beta$ , Fuegia, *Commerson, Captain King, Hombron.*

*a. Radix* repens, stolonifera: fibris flavidis, lanosis. *Culmus*  $\frac{1}{2}$ - $1\frac{1}{2}$ -pedalis, triquetus, lævis vel plus minus scaber. *Folia*  $\frac{1}{2}$ - $1\frac{1}{2}$  lin. lata, viridia, plana, flaccida, culmo breviora. *Bractea* infima foliacea, sæpe lineam lata, culmo subinde plus duplo longior, rarius eo brevior: superiores setaceæ, auriculis sæpe pallidis. *Pedunculi* setacei, læves. *Spica* terminalis mascula, 4-8 lin. longa, 1 lin. lata, sæpe basi mascula: squamis lanceolatis, acutis, angustioribus. *Spicæ* foemineæ 4-8 lin. longæ,  $2\frac{1}{2}$ -4 lin. latæ: sæpius omnes vel una alterave ima basi masculæ: infima rarius subradicalis. *Perigynium*  $1\frac{7}{10}$ - $\frac{8}{10}$  lin. longum,  $1$ - $1\frac{2}{10}$  lin. latum, compressum, ancipiti-trigonum: nervis sæpe apice evanidis: glaucum, demum ferrugineum, granulatum. *Achenium*  $1$ - $1\frac{1}{10}$  lin. longum,  $\frac{5}{10}$ - $\frac{6}{10}$  lin. latum,

ovali-triquetrum, castaneum, angulis pallidioribus, basi styli apiculatum.

A *C. limosa* differt spicis pluribus, terminalibus vel omnibus sæpe basi masculis; foliis planis, latioribus, flaccidis; bractea infima longiore et latiore; squamis ovato-lanceolatis, acuminatis.

In all, European and American specimens, the female spikes are frequently male at base, and, as in *C. limosa*, the scales are occasionally pallid.

Hoppe ascribes the name of *C. irrigua* to Smith, but I am not aware on what authority. It is not noticed in the 'English Flora,' and did not appear in the Supplement of 'English Botany' till 1845, where Mr. Babington has noticed the existence of male florets at the base of the spikes, a character which separates it essentially from *C. limosa*, and which has not been alluded to generally by authors. Koch refers to it, and Fries, in his Mantissa, iii., alludes to the terminal spike being often "apice foemineam." He adds: "Hoc gramen œconomico respectu summopere insigne, in pratis paludosis sylvaticis Sueciæ occidentalis præstantissimum fœnum offerens, hac ratione omnes alias Carices longe antecellens."

Drejer (Rev. p. 51) remarks that "Specimina Americana majora et vegetiora sunt, quam ulla Europæa, quæ vidi." As in the case of *C. livida*, Lapland specimens (Tab. CCVIII.) contrast with those from America (Tab. CCIX.), but I see no difference as to size in some of the Swedish and English specimens.

In the var.  $\beta$  (Tab. CCXX.) the scales are of a deep purple colour, but I can see no character to justify its separation from *C. irrigua*, which, if priority of names be an inflexible rule, should bear that of Lamarck. M. Spach says, in a note to me, "Specimina in Herb. Mus. Paris sunt 26, quorum 5 a Commersonio lecta (1767); reliqua legit Hombron ad Portum Famine (1840)—

16 = spicis 3. 2 sp. terminali mascula.

10 = „ 4. 24 „ „ basi mascula.

Spicæ laterales sæpe imâ basi masculæ. Differentiæ magni momenti inter hæc et *C. irriguam arcticam* sane vix ullæ statuendæ. Squamæ rigidiores, atro-sanguineæ; perigynium papillosum, ancipiti-trigonum, ut in *C. irrigua*."

In my own herbarium I have five specimens, collected in Captain King's voyage, three of which have four spikes and two have five, all "basi masculæ;" the culm scabrous, as is frequently the case in American specimens.

I have adopted the name of Lamarck, as I cannot see any specific distinction between the Fuegian and the European and American plant; but I have described the last as the typical form, as most generally known, giving a figure of the first as a var.  $\beta$  (Tab. CCXX.).

200. *C. monostachya* (Richard); spica simplici androgyna apice mascula fusco-ferruginea albo variegata nuda; stigmatibus 2-3; perigyniis (immaturis) ovalibus vel obovatis longe cylindrico-rostratis, rostro superne albo-hyalino, ore obliquo ciliolato, marginibus superne scabris pallidis enerviis, squama lanceolata inferne fusco-ferruginea apice conspicue albo-membranacea ciliolata angustioribus brevioribusque.—*C. monostachya*, *Rich. Fl. Abyss.* ii. 512. *Uncinia* digyna, *Hochstetter in Schimper Pl. Ews. Abyss. n.* 687 (*Un. Itin.* 1842). *C. parasitica*, *Kunze, p.* 83. (TAB. CCXXI.)

HAB. In Abyssinia, in monte Simensi Silpe, ad fines et supra fines arborum et fruticum, *Un. Itin.* 1842. In turfosis montium omnium Simensium, alt. 11-13,000 ped., *Schimper*, 1845, *Herb. Mus. Paris*. "Nulla inter Abyssiniæ Carices tam alte ascendit."

Cæspitosa. *Radix* fibris crassis sublignosis, pallidis. *Culmus* sub- $1\frac{1}{2}$ -pedalis, acutangulus, firmus, scaberrimus, basi foliatus, rudimentisque foliorum lucidis fuscis rigidis tectus. *Folia*  $1\frac{1}{2}$ -2 lin. lata, sub-bipedalia, plana, carinata, rigida,



longe triquetro-attenuata. *Ligula* truncata, pallide membranacea. *Spica*  $1\frac{1}{2}$  poll. longa, 2–4 lin. lata, apice subdimidiatim mascula. *Squamæ* acuminatæ fœmineæ; nervo longe infra apicem evanescente: infima major, amplexens, cuspidata: masculæ angustiores, acutiores, demum ad margines albob-membranaceæ. *Perigynium*  $2\frac{1}{2}$  lin. longum,  $\frac{7}{10}$ –1 lin. latum: rostro e medio sursum albo-hyalino. *Achenium*  $1\frac{1}{2}$  lin. longum,  $\frac{1}{2}$  lin. latum, obovatum, lenticulare vel trigonum, basi styli incrassata. *Racheola* pallida, ligulata, apice squamæformi, ferruginea, contorta, achenio longior. *Stigmata* 2, rarius 3. *Antheræ* longe appendiculatæ.

The largest of the *Psyllophoræ*, and in some respects allied to *C. nardina*, Fries. In some spikes, flowers with 3 stigmas are wanting, and in others they are not so frequent as those with 2. None of the specimens afford mature perigynia. Richard did not detect the racheola, though I have found it in most of the perigynia I have opened.

201. *C. glomerata* (Thunberg); spica ovata vel oblonga densiflora ferruginea, e spiculis 10–12 ovatis arcte congestis vel inferioribus subcompositis subdiscretis plus minus longe setaceo-bracteatis; stigmatibus 2; perigyniis late ovatis acuminato-rostratis bifidis plano-convexiusculis ferrugineis marginibus viridibus superne subalatis serrulatis nervatis, nervis postice sæpe superne evanidis, membranaceis divergentibus, squama ovata acuta cuspidata ferruginea latioribus longioribusque.—*C. glomerata*, *Thunb. Prod.* 14; *Fl. Cap.* i. 344; *Willd.* 232; *Kunth*, 384; *Nees in Linnæa*, vii. 534, x. 203; *non Schk. f.* 41, quæ *C. supina*; *non Host.*, quæ *C. stenophylla*. *C. vulpina*,  $\beta$  *glomerata*, *Wahl. Act.* 144. *C. reflexa*, *Dietr. (sec. Kunth)*. (TAB. CCXXII.)

HAB. In Africa. Cape of Good Hope, *Thunberg*, *Drège*, *Ecklon*, etc. Uitenhage, *Dr. Alexander*.

*Radix* repens. *Culmus* 8-lin.– $1\frac{1}{2}$ -ped., triqueter, lævis, firmus. *Folia* 1– $1\frac{1}{2}$  lin. lata, culmo breviora vel subæquantia, glaucescentia. *Bracteæ* e basi ovata setaceæ, spiculis breviores vel æquantes: infima nunc spica longior. *Squamæ* omnes acutæ, cuspidatæ. *Spica* 9–12 lin. longa, 4–6 lin. lata. *Spiculæ* inferiores 4 lin. longæ, 3 lin. latæ, simplices vel compositæ. *Perigynium*  $1\frac{9}{10}$ –2 lin. longum,  $\frac{9}{10}$ –1 lin. latum, compressum; membranaceum. *Achenium*  $\frac{9}{10}$  lin. longum,  $\frac{6}{10}$ – $\frac{7}{10}$  lin. latum, suborbiculatum, abrupte apiculatum, basi productum, basi styli clavata.

A *C. vulpina*, L., differt culmo graciliore, lævi; angulis minus argutis; foliis glaucescentibus, angustis; squamis omnibus acutis, cuspidatis; perigyniis membranaceis, compressis, rostro brevior radice repente.

202. *C. rosea* (Schkuhr); spica oblonga vel subelongata pallida, e spiculis 4–8 androgynis apice masculis stellatim rotundatis, superioribus vel omnibus contiguis vel inferioribus plus minus remotis longe setaceo-bracteatis; stigmatibus 2; perigyniis ovalibus acuminato-rostratis bidentatis plano-convexis superne marginibus inflexis acutis scabris enerviis vel rarius leviter nervatis postice basi spongiosis corrugatis pallide viridibus demum castaneis, squama late ovata obtusissima vel infima acuta mucronulata albida subduplo longioribus.—*C. rosea*, *Schk. Z. Z. f.* 179; *Willd.* 237; *Muhl.* 223; *Kunth*, 386; *Ell.* 531; *Dewey*, x. 276; *Schw. and Tor.* 302; *Darlington*, 846; *Carey*, 513; *Sartwell*, *Eas. n.* 24; *Chapman*, 534. (TAB. CCXXIII., Var.  $\beta$ , TAB. CCXXIV., et Var.  $\gamma$ , TAB. CCXXV.)

HAB. In America septentrionali. Canada to Carolina. Columbia River, *Scouler*.

*Radix* fibrosa. *Culmus* 1– $1\frac{1}{2}$ -pedalis, filiformis, obtusangulus, apice triqueter, scaber, sæpe demum reclinatus. *Folia* sublineam lata, culmo longiora vel breviora, graminea. *Bractea* infima setacea, plus minus elongata, sæpe spicam superans: altera spiculam æquans vel triplo longior. *Spica* 1– $2\frac{1}{2}$  poll. longa, 3–4 lin. lata. *Spiculæ* e perigyniis divergentibus stellatim radiatæ, rotundatæ, apice parce masculis, basi flosculis fœmineis 4–12 instructæ, rarius omnes contiguæ: inferiores deorsum plus minus remotæ. *Squamæ* hyalinæ: fœmineæ plerumque obtusissimæ, muticæ. *Perigynium*  $1\frac{6}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, sæpius enerve, vel leviter nervatum, basi demum spongiosum, corrugatum, membranaceum. *Achenium*  $\frac{8}{10}$ – $\frac{9}{10}$  lin. longum,  $\frac{6}{10}$ – $\frac{7}{10}$  lin. latum, ovatum, obtusum, pallidum, basi styli conico-incrassata. *Stigmata* brevia, convoluta.

Var.  $\beta$ . *minor*; spiculis 4–6 minoribus discretis; perigyniis magis erectis; squamis sæpius acutis longioribus; stigmatibus longioribus nec convolutis; foliis angustioribus.—*C. retroflexa*, *Muhl. Schw. (ex parte)*. (TAB. CCXXIV.)

Var.  $\gamma$ . *radiata* (Dewey); spiculis 3–4 remotis paucifloris erectis vel patulis; squamis acutis vel obtusis; stigmatibus brevibus convolutis; culmis brevibus capillaceis; foliis angustis.—*C. neglecta*, *Tuck. En.* 19 (*fide spec. authent.*). *C. trisperma*, *Gray, Spec. Eas. n.* 151 (*ex Ulrica*). (TAB. CCXXV.)

Willdenow referred the "*C. stellulata*,  $\beta$  *radiata*," of Wahl. Act. 147, to *C. rosea*, with a query, and he has been followed more confidently by others. Dewey (*Sill.* vii. 271) notices the position of the male florets as inferior in Wahlenberg's plant, and suggests that it may be referable to *C. scirpoides*, Schk. Probably to that plant or to *C. trisperma*, Dewey.

I suspect the var.  $\beta$  and  $\gamma$  insensibly pass into each other. Tuckerman describes his *C. neglecta* as having the male florets inferior; but I have his original specimens, which are identical with the  $\beta$  *radiata*, Dewey. Schweinitz, from a specimen I have of his, considered the var.  $\beta$  to be *C. retroflexa*; and Muhlenberg (p. 220) describes the "capsula [of *C. retroflexa*] margine glabra et subscabra," the last character being applicable only to *C. rosea* and its varieties.

203. *C. retroflexa* (Muhlenberg); spica oblonga pallide ferruginea, e spiculis 3–6 androgynis apice masculis ovatis contiguis vel inferioribus distinctis plus minus longe setaceo-bracteatis; bracteis deciduis; stigmatibus 2, longis; perigyniis late ovatis brevi-rostratis, vel oblongis longius rostratis bidentatis basi turgide spongiosis ibique nervatis, nervis superne evanidis appressis vel inferioribus retroflexis marginibus lævibus obtusis, squama ovato-lanceolata acuta vel cuspidata decidua pallide ferruginea, nervo viridi vix aut paulo longioribus.—*C. retroflexa*, *Muhl.* 219; *Willd.* 235; *Schk. K. K. f.* 140; *Kunth*, 386; *Schw. and Tor.* 301; *Elliott*, 528; *Dewey*, vii. 271, and x. 277; *Carey*, 513; *Sartwell*, *Eas. n.* 26; *Chapman*, 534. *C. rosea*,  $\beta$  et  $\gamma$ ?, *Tor. Mon.* 389. (TAB. CCXXVI.)

HAB. In America septentrionali. New England to Texas.

*Radix* fibrosa. *Culmus*  $\frac{1}{2}$ – $1\frac{1}{2}$ -pedalis, gracilis, obtusangulus, lævis vel apice scabriusculus. *Folia*  $\frac{1}{2}$ – $\frac{3}{4}$  lin. lata, culmo breviora. *Bracteæ* 1–2, elongatæ, basi nervosæ: infima sæpe spica longior. *Squamæ* conformes. *Spica* 6–15 lin. longa, 2



lin. lata. *Spiculæ* ovatae, acutae: superiores vel omnes contiguae; inferiores nunc discretæ, apice sæpe subdimidiatim masculæ. *Perigynium* late ovatum, brevi-rostratum,  $1\frac{2}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum: vel oblongum, longius rostratum,  $1\frac{1}{2}$  lin. longum,  $\frac{1}{2}$  lin. latum, basi spongiosum: nunc insolite turgidum: nervis superne evanidis, marginalibus postice visis: marginibus lævibus obtusis. *Achenium*  $\frac{7}{10}$ – $\frac{8}{10}$  lin. longum,  $\frac{5}{10}$ – $\frac{7}{10}$  lin. latum, ovatum: basi styli conico-inerassata.

The form of the perigynium in the Texan plant is narrower, more oblong, longer rostrate, resembling that of *C. rosea*. In the Rhode Island specimens, which are fully mature, with the scales and bracts often fallen, the perigynium is broadly ovate, with a shorter rostrum; and the ovate spiculæ, with frequently appressed perigynia, contrast very strongly with those of *C. rosea*. The peculiar turgid form of the perigynium is especially observable in the Rhode Island specimens, and I think Schw. and Torrey allude to it in describing the perigynium as "obscurely triangular." The essential character of *C. retroflexa* is in the smooth margins of the perigynium, and the longer acute or cuspidate scales. I suspect in this androgynous group the form of the perigynium is always apt to be modified by the deposition of spongy matter between the surfaces in the fully mature state. The Texan specimens are not as mature as those from Rhode Island, gathered by Mr. Olney.

204. *C. bromoides* (Schkuhr); spica oblonga pallida demum straminea vel ferruginea, e spiculis 4–6 vel 8 contiguis oblongis inæqualibus laxifloris monoicis fœmineis vel masculis, vel androgynis basi vel apice masculis, infima sæpe subremota bracteata; stigmatibus 2, longis gracilibus; perigyniis lineari-lanceolatis longe rostratis, ore integro vel emarginato antice alte fisso, superne marginibus scabris plano-convexis, utrinque nervatis membranaceis basi spongiosis erectis, squama ovato-lanceolata acuminata acuta vel mucronata hyalino-albida, nervo viridi demum pallide ferruginea subæquilata longioribus.—*C. bromoides*, *Schk. f.* 176; *Willd.* 258; *Kunth*, 377; *Muhl.* 219; *Dewey, Sill.* viii. 264; *Schw. et Tor.* 300; *Darlington*, 344; *Elliott*, 528; *Carey*, 539; *Sartwell, Eas. n.* 10; *Chapman*, 533. *C. festucea*?, *Elliott*, 535. (TAB. CCXXVII.)

HAB. In America septentrionali. British America and Rocky Mountains, *Torrey*. New England to Florida.

*Culmus* 1–2½-pedalis, acute triquetèr, scaber, debilis, quandoque decumbens, basi foliatus. *Folia* 1 lin. lata, culmo multum breviora: radicalia eum subæquantia, graminæ, plana. *Bracteæ* squamæformes: infima setaceo-cuspidata, spicula quandoque longior, basi amplexans. *Spica* 1–2 poll. longa, 3–5 lin. lata. *Spiculæ* sæpius 4–6, inæquales; extremæ longiores, 6–9 lin. longæ, 2 lin. latæ; intermediæ minores; omnes laxifloræ: distributione staminum variabiles: omnes omnino masculæ, vel fœminæ, vel androgynæ basi vel apice parce masculæ: sæpe infra spiculam terminalem una vel altera minor mascula: reliquæ fœminæ. *Spica mascula* brevior, 6–9 lin. longa. *Spiculæ* semper contiguae, ebracteatae. *Squamæ* conformes. *Perigynium*  $2\frac{2}{10}$ – $\frac{3}{10}$  lin. longum,  $\frac{4}{10}$ – $\frac{5}{10}$  lin. latum, pallidum, demum olivaceum vel ferrugineum, basi demum spongiosum: nervis magis coloratis: ore integro, antice sæpe alte fisso. *Achenium* fere 1 lin. longum,  $\frac{4}{10}$  lin. latum, oblongo-ovatum, basi productum, ferrugineum, basi styli incrassata.

The irregular distribution of the stamens in this species has given rise to some discrepancy in the descriptions of those who have noticed it. Willdenow says, "Ab omnibus distinctissima, habitu *C. elongatæ* simillima. Masculæ enim spica, non, ut in reliquis, terminalis, sed sub terminali fœminæ inserta: valde caudata, ut in fructiferis culmis non obvia, huic faciem androgynarum

specierum dat." This male spicula however is not always present. Willdenow had not seen the entire male spike. Muhlenberg says, "Spica suprema inferne mascula, cæteris 4 et pluribus fœmineis: mediis interdum masculis." Torrey says, "Suprema superne staminifera, cæteris pistilliferis vel androgynis inferne vel superne staminiferis." And again, he says, "Sometimes the upper spikelet is sterile below, the others with sterile florets both above and below: generally there are but about two sterile florets on the summit of each spike: occasionally an entire sterile spike occurs." Carey says, "Some of the central spikes wholly fertile." Darlington says the same. Carey adds, "occasionally dioicous." Elliott (p. 536) says the male florets are sometimes on the summit of the spikes, or occupy nearly the whole of the middle spikes. My authority for both his species is Mr. Curtis.

My own observation accords rather with that of Muhlenberg, except that he does not notice the separate male spike, which I think is found on the same root with the androgynous one.

Willdenow describes the female spikes as "include subpedunculatis." I have seen nothing to justify this remark beyond the separate spike I have figured with a foliaceous remote bract, having the rudiment of a female spike within its elongated sheathing base.

Tuckerman, I think, correctly, associates this species with *C. Deweyana*. In the form of its perigynium, and in its long gracile stigmata, it is like the *C. longicurvis* of India.

205. *C. desponsa* (Boott); spicis 5–7 cylindricis densifloris erectis rubro-ferrugineis concoloribus, terminali rarius mascula, reliquis vel omnibus apice masculis vel infima interdum omnino fœminea, summis sessilibus contiguis proximis inserte inferioribus longe exserte pedunculatis, basi attenuatis remotis; bracteis vaginatis foliaceis, inferioribus culmo brevioribus vel longioribus; stigmatibus 3; perigyniis ellipticis triquetris longe rostratis, ore bilobato demum alte fisso, marginibus acutis superne serratis utrinque nervatis lucidis glabris, squama ovata acuta vel truncata vel emarginata valide hispido-cuspidata trinervi subæquilata longioribus (TAB. CCXXVIII.)

HAB. In India Orientali, in regione temperata montium Khasiæ, alt. 5–6000 ped., *Dr. Hooker* and *Dr. Thomson*.

*Culmus* 2–3-pedalis, basi validus, lævis, inter spicas scaber, basi rudimentis foliorum vaginisque rubro-purpureis tectus; pars spicas gerens 9–15 poll. longa. *Folia* 2–2½ lin. lata, culmo longiora vel breviora, plana, supra tuberculato-asperata, firma. *Bracteæ* vaginatae, foliaceæ, spicis longiores: infima nunc culmo longior. *Vagina* infima 1–2 poll. longa. *Pedunculus infimus* 1½–6 poll. longus. *Spicæ* 1–2¼ poll. longæ, 3–3½ lin. latæ: infima rarius basi spicula brevi composita. *Squamæ* conformes, nisi masculæ supremæ acutæ muticæ. *Perigynium* 3 lin. longum,  $\frac{2}{10}$  lin. latum: ore bilobato, obtuso, ad margines albo, hyalino. *Achenium*  $1\frac{4}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, ellipticum, triquetrum, basi styli æquali (supra basin tumida) apiculatum.

Ad *C. Boryanæ* formas depauperatas accedit. Differt laciniis rostri lobatis, obtusis, intus membranaceis, nec perigyniis punctatis.

It belongs to the *Hymenochlenæ* of Drejer.

206. *C. myosurus* (Nees); spica longissima plus minus composita laxa castanea vel fusco-purpurea, e spicis partialibus pluribus, inferioribus laxissimis remotis basi ramosis longe exserte pedunculatis; spiculis elongatis gracilibus sæpe curvatis apice subdimidiatim caudato-masculis basi demum laxifloris, summis 3–5 simplicibus alternis remotis, inferioribus in ramis plus minus compositis longis insidentibus; rachi superne filiformi nutante; bracteis inferioribus latis culmo longioribus longe



vaginatibus 3; perigyniis ellipticis utrinque acutis vel obovatis triquetris rostratis bifidis leviter nervatis scabris marginibus superne serratis quadrifariis oblique adscendentibus vel subexcurvis pallidis vel fuscis, squama lanceolata acuta brevi-cuspidata dorso striata lævi vel puberula castanea vel purpurea margine superne angusta albo-hyalina longioribus.—*C. myosurus*, *Nees*, *Wight*, *Contr.* 122; *Kunth*, 507. (TAB. CCXXIX.—CCXXXIII.)

HAB. In India orientali. In Himalaya subtropica et temperata. Simla, *Edgeworth*, alt. 5–7000 ped. Kumaon, *Royle*, n. 104. Nepal, *Wallich*, n. 3382, 3384. Sikkim, et Nepal orient., alt. 5–8000 ped., *Dr. Hooker*. Bhotan, *Griffith*. Nilghiri, *Wight*, 1913, etc.

*Culmus* 5–6-pedalis, validus, basi vaginis ferrugineis reticulato-fissis tectus, apice gracillimus, cernuus, scaber; pars spicas gerens sæpe 4-pedalis. *Folia*  $2\frac{1}{2}$ –6 lin. lata, longissima. *Bracteæ* summæ squamæformes: superiores setaceæ, spicis longiores: inferiores latæ, culmo longiores. *Vagina* infima 4 poll. longa. *Pedunculi* inferiores sæpe pedales, longe exserti: rachis spicarum superne filiformis, cernua. *Spicæ* partiales 10–12, apice spiculis sub-4 simplicibus remotis instructæ, basi deorsum magis magisque ramosæ. *Rami* superiores 3–4, spiculiferi: inferiores elongati, 8–12-poll., cernui, plus minus compositi, laxi: ramuli e vaginulis muticis vel setaceo-cuspidatis egredientes. *Spiculæ* 8 lin. ad  $2\frac{1}{2}$  poll. longæ,  $1\frac{1}{2}$ –2 lin. latæ, basi laxifloræ, rectæ vel curvæ, omnes apice masculæ; pars staminifera subdimidiam vel partem longiorem vel brevior spiculæ occupans. *Squamæ* castaneæ vel fusco-purpureæ, apice ad margines albo-hyalinæ, lanceolatæ vel oblongo-ovalæ; sensim, rarius abrupte, acuminatæ; acutæ, breve hispidocuspidatæ; dorso puberulæ, medio leviter striatæ. *Perigynium*  $1\frac{2}{3}$ – $2\frac{1}{3}$  lin. longum,  $\frac{1}{10}$ – $\frac{6}{10}$  lin. latum. *Achenium*  $1\frac{1}{10}$ – $1\frac{2}{10}$  lin. longum,  $\frac{4}{10}$ – $\frac{5}{10}$  lin. latum, ellipticum, breve stipitatum, fuscum; angulis concoloribus, faciebus planis.

Variat colore castaneo vel fusco-purpureo; inflorescentia simplici vel decomposita, semper laxa; perigyniis pallidis vel fuscis, plerumque adscendentibus, vel subexcurvis, nunquam horizontalibus nec rubris nec purpureis lucidisve, semper triquetris, achenium arete vel laxiuscule vestientibus.

It is impossible within the limits of a single plate to do justice to these fine paniculate species, and in Tab. CCXXIX. I have given a reduced figure of a large specimen from the Pulney Mountains, in the Peninsula of India, sent to me by Dr. Wight, identical with the Dindygul specimen in Herb. Arnott, to show the habit, the proportions being about one-fifth of the natural size; and in Tab. CCXXX. the upper portion of this specimen is represented in its natural proportions. I have since seen specimens from Bhotan, collected by Griffith, with a more diffuse composite inflorescence, the branches in the lower partial spikes being occasionally a foot in length. So variable is the development however that in one of Dr. Wight's specimens the lower spike is reduced to a solitary spicula. The species varies not only in the simple or compound inflorescence, and in the colour of the squamæ, but in the length of the male apex of the spiculæ, in the size and form of the perigynium, and in the breadth of the leaves. In the simpler forms the partial spikes have the spiculæ arranged alternately on an unbranched rachis, or the lower spikes have one or two branches at base, each bearing 1–3 spiculæ; and in the more compound forms several of the lower spikes have several long compound branches, with alternate simple spiculæ at top, and ramuli at the base. The squamæ vary from a pale or light ferruginous, to a dark-purplish colour, appearing the more membranous the paler they are, and they vary from being narrow-lanceolate, gradually acute, to being broader, shorter, obtuse, with an abrupt acumination, and the cuspidate extension of the rib is longer or shorter, rarely at times obsolete.

The pubescence on the dorsum of the squamæ is occasionally indistinct or absent. The perigynium varies from  $1\frac{2}{3}$  to  $2\frac{2}{3}$  of a line in length, always triquetrous, and generally closely but sometimes loosely investing the achenium. It is scabrous on the upper part, but judging from the Sikkim specimens, becomes smoother, except at the margins, by age. The erifice I believe is normally acute, but the laciniae, which are serrate, are easily injured, and then the epithet of Nees, "laciniiis præmorsis," applies. The spongy base contracts by age and gives an obovate form to it. Its colour is pale or more or less ferruginous at the upper part, or, as in the Sikkim and Bhotan specimens, the entire perigynium is of a dark opaque hue. In Herb. Arnott I observe a specimen from Courtallum, with the unpublished name of *C. æquata*, Nees, which differs in no other respects than that the male apex of the spiculæ is broader than usual, from the loose imbrication of the squamæ. All Dr. Wight's specimens. Wallich's n. 3382, and one of Griffith's, are pale; Dr. Hooker's Sikkim, Mr. Edgeworth's from Simla, Royle's n. 104, Wallich's n. 3384, and Griffith's from Bhotan, are purple.

The specimens figured are,—

Tab. CCXXIX. and CCXXX. From the Pulney Mountains; the same as the Dindygul specimen, n. 1913 in Herb. Arnott (not in Herb. Wallich or Herb. Banks).

Tab. CCXXXI. Specimen from Herb. Wallich, n. 3384; the spiculæ too straight, not showing their tendency to curvature, the inflorescence simple.

Tab. CCXXXII. Specimen from the Nilghiri, n. 1291, Herb. Arnott: the spiculæ with shorter male apices, the perigynia broader, loosely investing the achenium.

Tab. CCXXXIII. Specimen from Sikkim: the inflorescence more composite, and some of the perigynia more obovate than usual.

207. *C. baccans* (Nees); inflorescentia *C. myosuri*, sed brevior densior, spicis partialibus erectis; rachi rigida; spiculis crassioribus strietis congestis plus minus apice masculis; perigyniis turgide ovalibus vel globosis sæpe gibbosis inflatis horizontaliter divergentibus basi obtusis plus minus sæpe abrupte rostratis bifidis rostro deorsum spectante costato-nervosis glabris vel superne scabris, marginibus apice serratis, olivaceis vel flavidis rubro-tinctis demum atro-purpureis lucidis, squama late ovata æquilata obtusa, dorso striato-nervosa puberula cuspidata ferrugineo-purpurea margine albo-hyalina demum decolori longioribus.—*C. baccans*, *Nees*, *Wight*, *Contr.* 122; *Kunth*, 513. *C. curvirostris*, *Kunze*, 79. t. 20. (TAB. CCXXXIV.—CCXXXIX.)

HAB. In India orientali: in regionibus tropicis et subtropicis Himalayæ orientalis ad Sikkim, alt. 2–6000 ped., *Dr. Hooker*. Khasiæ, *Griffith*, *Dr. Hooker*, *Dr. Thomson*. Nilghiri, *Dr. Wight*, n. 1912, etc. Bombay, *Mr. Scott*. Ceylon, *Walker*. Java, *Dr. Horsfield*, *Gæring*. China, *Sir Geo. Staunton* (*Herb. Banks*). Cochin China, *Gaudichaud* (*Herb. Mus. Paris*).

*Culmus* (pars spicas gerens sesquipedalis), *folia*, *bracteæ*que ut in *C. myosuro*. *Spicæ* partiales inferiores, 6–8 poll. longæ, strictæ, erectæ, pedunculis rigidis. *Spiculæ* subcrassæ, congestæ. *Perigynium*  $1\frac{2}{3}$ – $2\frac{2}{3}$  lin. longum,  $\frac{1}{10}$ – $1\frac{2}{10}$  lin. latum, colore formaque varians, vel olivaceum, angulatum, vel flavidum, rubro plus minus tinctum, demum atro-purpureum, inflatum, lucidum, dorso arcuatum, rostro deflexo antice sæpe gibbosum, plus minus apice ad nervos vel inter nervos scabrum, costato-nervosum, nervis demum obsoletis; ore, nervis marginalibus excurrentibus, acute bifido. *Achenium*  $1\frac{2}{10}$ – $\frac{5}{10}$  lin. longum,  $\frac{5}{10}$ – $\frac{6}{10}$  lin. latum, ovale vel ellipticum, triquetrum, fuscum, facibus concaviusculis punctulatum, oblique breve stipitatum; stylo obliquo basi incrassato.

1. Variat inflorescentia laxiore, vel spicis inferioribus elon-



gatis, laxis, ambitu lanceolatis; spiculis apice longe attenuato-masculis; perigyniis olivaceis vel atro-purpureis.—Java, E. Nepal, Khasia.

2. Inflorescentia simpliciore; perigyniis ovalibus, minus turgidis, sæpe oblique adscendentibus, rostro plus minus longo; squamis nunc lanceolatis, acutis.—Myong Valley, E. Nepal, Khasia (*Hooker*).

3. Inflorescentia densissima; perigyniis globosis, lutescentibus, plus minus vivide rubro-tinctis, transversim corrugatis, demum atro-purpureis.—Khasia, China.

4. Inflorescentia densissima; perigyniis oblongis, (immaturis) olivaceis, angulatis, demum atro-purpureis, inflatis, teretibus; nervis obsoletis, lucidis; spiculis sæpe apice breve masculis; ramis spicarum nunc bracteolis longis setaceis suffultis.—Khasia, Bombay, Nilghiri.

It would be evident to any one, on examining a large suite of specimens of this noble and beautiful species, that these varieties insensibly blend together, there being nothing of a fixed or determinate character in the inflorescence or in the form or colour of the perigynium. I believe the olive-colour to depend on immaturity or on locality. It may be observed on some spikes, the general hue of which is red or purple, and in all cases the eventual colour in old specimens is a dark lustrous purple. The most striking contrast is in the var. 3, the colour of which in Dr. Hooker's specimens is a bright red, or as Gaudichaud says, "d'un rouge de corail," but this colour is more or less mixed with yellow. In Griffith's specimens it is nearly all yellow, or in older ones dark-purple. Sir George Staunton's specimens from China are like Dr. Hooker's, the form of the perigynium in all being globular, with transverse corrugations; but in Gaudichaud's, which have these corrugations, the form is oblong, and the colour a dark-purple.

In Dr. Horsfield's Java specimen, Tab. CCXXXIV., the inflorescence is lax throughout, like that of *C. myosurus*, while in some of Dr. Hooker's and Griffith's this laxity is principally in the lower spikes. I have other specimens, in a young state, from Dr. Horsfield, from Java, with a very dense composite inflorescence; and M. Spach tells me that specimens from Java collected by Gœring and preserved in the Paris Herbarium, are equally dense, but the perigynia, not fully mature, are olivaceous, while Dr. Horsfield's, fully mature, are of a dark purple. In var. 2 the perigynia on some of Dr. Hooker's specimens are only sub-turgid, and not gibbose, but in others from the same locality, "Myong Valley, E. Nepal," they are more inflated and gibbous, often divergent, with a deflexed rostrum.

There is nothing constant in the length or breadth of the male apex of the spiculæ. In a young state it is shorter and broader from the loose imbrication of the squamæ, but it always contracts, and I suspect elongates by age. But in the same spike, even in age, it varies in length. In all the forms the colour of the squamæ is of a ferruginous purple, with broad hyaline margins, but eventually the colour entirely fades away. The form is generally broadly ovate and obtuse, rarely lanceolate and acute, with a longer or shorter cuspidation.

*C. baccans* is distinguished from *C. myosurus* by the inflated, coloured, horizontally divergent perigynium, with its deflexed rostrum, and in well-marked specimens by its erect, rigid, compact inflorescence.

Nees founded it on Dr. Wight's specimen n. 1912, which I have seen in Herb. Arnott. In describing the perigynium of *C. myosurus* he says, "fructu trigono gibbo." But this last character does not apply to it. *C. myosurus* was founded on a specimen of Dr. Wight's n. 1913 and Wallich's n. 3384. This last number in Herb. Wallich (Lin. Soc. Herb.) includes *a. C. myosurus*, found by Wallich in Nepal, and *b. C. baccans*, sent to Wallich by Dr. Wight from Dindygul, and I suspect some perigynia of *C. baccans* were sent with n. 3384 to Nees: for in Herb. Wallich there is a small paper packet attached to the specimens, which contains perigynia of *C. baccans* with those of *C. myosurus*. Dr. Wallich does not appear to have found *C. baccans*, and the specimen which he received from Dr. Wight he united as a var. *b.* of his *C. myosurus*.

It is evident also that Dr. Wight did not distinguish them, for while the Dindygul specimen n. 1913 in Herb. Wallich and also in Herb. Banks is *C. baccans*, in Herb. Arnott it is *C. myosurus*, identical with one I have from Dr. Wight, and which is figured in Tab. CCXXIX. and CCXXX.

*C. baccans*, like *C. myosurus*, varies in the more or less composite inflorescence, as is the case in all these Indian paniculate species. I was for a long time doubtful what to consider the Java specimen, Tab. CCXXXIV., and the inflated, coloured, divergent perigynium alone led me to refer it to *C. baccans*. In more characteristic specimens, from the compactness of the inflorescence, *C. baccans* often presents a dense mass of coloured baccate fruit 10 to 12 inches in length and from 4 to 6 inches in breadth. As to the rudiment within the perigynium, noticed by Nees, I have observed it occasionally in some of Dr. Hooker's specimens, but its form is so obscure that I have had some difficulty in determining its nature. It has presented the appearance of a broad, ribbed, twisted scale, the existence of pistils alone indicating its nature.

The specimens figured are,—

Tab. CCXXXIV. The Java specimen of Dr. Horsfield, alluded to in var. 1, with the lax inflorescence and slender peduncles, the quadrifarious arrangement of the perigynia, and the long caudate male apex to the spiculæ, thus approaching in habit *C. myosurus*, but with the purple, horizontally diverging, inflated perigynia, and the broad obtuse scale, striate nerves, and broad hyaline margin of *C. baccans*. The perigynium is more or less gibbous,  $\frac{8}{10}$ – $\frac{9}{10}$  lin. wide, obtuse at base, with its short oblique stipes; the achenium elliptic,  $1\frac{3}{10}$ – $\frac{4}{10}$  lin. long,  $\frac{6}{10}$  lin. wide, with an oblique stipes, and a style depressed at base and curved. The spiculæ issue from a spathella or ruptured proliferous perigynium, such as is figured in Tab. CCXXXVIII.

Tab. CCXXXV. Fig. 1, is the lower spike, of a lanceolate outline, of a specimen of Dr. Hooker from E. Nepal, the inflorescence more compound, the rachis stouter, and the male apices of the spiculæ shorter and broader. The perigynia are old, of a spongy texture, rough between the nerves, which are almost obliterated as well as the roughness by age,  $1\frac{2}{10}$  lin. wide. The achenium  $1\frac{3}{10}$  lin. long,  $\frac{7}{10}$  lin. wide. The lower branch of the spike has a bracteola.

Fig. 2 is a spicula from a younger specimen from the same locality, exhibiting the shorter broader male apex. The perigynia on this specimen are of an olive colour, while in some of Griffith's this prevalent colour may be seen passing into red or purple.

Fig. 3 is a portion of a spike and a perigynium from a specimen of Dr. Hooker's from Khasia, alluded to in var. 3. The perigynium is  $1\frac{7}{10}$  lin. long,  $\frac{7}{10}$ –1 lin. wide, yellowish, tinged with bright red, with transverse corrugations, like the specimens of Sir G. Staunton, from the province of Chiangton, China. The achenium  $1\frac{3}{10}$  lin. long,  $\frac{6}{10}$  lin. wide. In Griffith's specimens from the same quarter the perigynia are yellow, or in old specimens of a dark lustrous purple, while in Gaudichaud's specimens from Cochin China, the form of the perigynium is oblong.

Tab. CCXXXVI. A specimen of Dr. Wight's from the Nilghiri, with short, comparatively simple partial spikes, and, as Nees says, "inferioribus spicarum geminatis ternatisve." The perigynium  $\frac{7}{10}$ – $\frac{8}{10}$  lin. wide, angular, rough, and of an olive colour. That at *a.* young, that at *b.* seen from the posterior surface, with a membrane extending from the laciniae, and as seen from that surface, not showing the curved deflexed rostrum, visible only on a lateral view. In the young perigynia the achenium is  $\frac{4}{10}$  lin. wide; but in old specimens, from the same locality, the perigynium is of a dark purple; and specimens of this age are the var.  $\beta$  of Nees, "fructu magis inflato et minus evidenter nervoso, rugoso, crassiusculo."

Tab. CCXXXVII. A specimen of Dr. Hooker's from Khasia, alluded to in var. 2; the perigynia  $1\frac{7}{10}$ – $\frac{9}{10}$  lin. long,  $\frac{8}{10}$ – $\frac{9}{10}$  lin. wide, less or more turgid and gibbous, with a larger and more gracile rostrum, often obliquely ascending or divergent, of a reddish-ferruginous colour, the orifice showing the exerted marginal nerve, which, broken off, would render it the "laciniiis præmorsis" of the *C. myosurus* of Nees. The achenium is shorter,  $1\frac{2}{10}$ – $\frac{3}{10}$  lin. long,  $\frac{6}{10}$ – $\frac{7}{10}$  lin. wide, and the squamæ are lanceolate and



subacute. Other specimens from the same locality verge more directly into the usual character of *C. baccans*, and in all the rigid erect inflorescence is of that species.

Tab. CCXXXVIII. Is a young plant from the Edinburgh garden, showing the divergent inflated perigynium in this early stage of development. The colour of the perigynium is yellow, tinged with bright red. I have another young specimen from the Leipzig Garden, of the same kind in form and colour, sent to me by Kunze as "*C. Indica*."

Tab. CCXXXIX. exhibits the lower spikes from specimens of Dr. Hooker from Khasia, showing the dense mass of spiculæ with their baccate fruit; the branches of the spikes naked or subtended by long filiform bracteolæ; the spiculæ with longer or shorter male apices. The middle specimen exhibits the occasional depauperate state of the spikes, the lowest reduced to a single spicula. The colour of the perigynia is generally olivaceous, though occasionally tinged with red or purple, and none are fully mature.

It will be evident to any one who examines *C. baccans* and *C. myosurus* that, while they differ in the extreme forms, they occasionally unite in some characters, exhibiting, as Mr. Darwin would say, their descent through modification from a common type.

208. *C. Bengalensis* (Roxburgh); spica elongata straminea concolori, e spicis partialibus singulis (ambitu late ovato) duplicato-vel triplicato-decompositis inferioribus remotis longe exserte pedunculatis erectis; spiculis parvis oblongis numerosis androgynis apice masculis divaricatis, sæpe basi, e squamis sterilibus appressis, attenuatis; bracteis inferioribus longe vaginatis culmum superantibus; stigmatibus 3; perigyniis ovalibus obtuse trigonis subinflatis sessilibus plus minus longe rostratis rectis vel excurvis, ore integro obliquo vel bifido ciliato, valide nervosis glabris vel apice scabriusculis, marginibus superne serratis, olivaceis plerumque purpureo-maculatis demum spongiosis, squama late ovata subinde emarginata glabra vel ad basin spicularum dorso scabriuscula lineolis ferrugineis notata hispido-cuspidata æquilata patenti longioribus.—*C. Bengalensis*, *Roxb. Fl. Ind.* (Tab. CCXL., CCXLI., CCXLII., CCXLIII.)

HAB. In India orientali, in regionibus tropicis et temperatis Himalayæ, Bengalix, et Khasiæ, alt. 6000 ped. Ad Silhet et Khasia, *Wallich, Griffith, Dr. Hooker, Dr. Thomson*. Bhotan, *Booth*. Nepal, *Wallich, n.* 3400 b. (*ex parte*). Kumaon, *Blinkworth*. Simla, *Jacquemont*. Hongkong, China.

*Culmus* 3-pedalis, obtusangulus, validus, lævis, apice gracilis, scaber; pars spicas gerens 15–18 poll. longa. *Folia* 3–5 lin. lata. *Bractea* inferiores latæ, culmo longiores. *Spica* partiales 2–4 poll. longæ, 1–3 poll. latæ. *Rachis* angulata, scaberrima. *Spiculæ* 3–7 lin. longæ, basi 3 lin. latæ, apice plus minus longe lateque masculæ: *terminales* (sæpe aliæ) basi, e squamis vacuis appressis, steriles et quasi pedicellatæ. *Squamæ* omnes pallide stramineæ, lineolis ferrugineis notatæ: masculæ nunc plures nunc pauciores, arcte vel laxiuscule imbricatæ, mucronatæ, glabræ: fæmineæ late ovatæ, acutæ vel obtusæ, rarius emarginatæ, longius cuspidatæ, glabræ, una alterave solum ad basin spicularum dorso scabriusculæ. *Perigynium* pallide stramineum, sæpe magis conspicue intus (dempto achenio) quam extus purpureo-maculatum, plus minus longe rostratum; ore (in una eademque spica) vel integro, oblique fisso (membrana inter margines usque ad apicem extensa), vel bifido, ciliato; glabrum vel superne inter nervos scabriusculum; marginibus rostri serratis; costato-nervosum, rectum vel excurvum, papilloso-granulatum, sessile: (vix maturum)  $1\frac{6}{10}$  lin. longum, plus  $\frac{4}{10}$  lin. latum, acute triquetrum, achenium arcte

vestiens: (senile)  $1\frac{6}{10}$ –2 lin. longum,  $\frac{6}{10}$ – $\frac{8}{10}$  lin. latum, obtuse trigonum, turgidum, subinflatum, spongiosum. *Achenium*  $\frac{7}{10}$ – $\frac{8}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, ovale vel ellipticum, acute triquetrum, pallidum, demum atro-purpureum, faciebus concaviusculis, punctulatum; basi styli incrassata.

I have a specimen from Dr. Wallich collected by Mr. Bruce in the Juntea Hill, Khasia, the perigynia in which are not mature, and which from their acutely triquetrous form, closely investing the achenium, contrast with those in the specimens of Griffith, which are old, turgid, and subinflated. I have examined also a very extensive suite of specimens collected by Hooker and Thomson, which are intermediate in point of age, and I cannot detect any essential difference. No dependence can be placed on the greater or less number of the male florets, or on the smoothness or roughness of the perigynium, or on the character of its orifice. I believe the normal state of the orifice is entire, obliquely cut, though in the same spike you observe it distinctly bifid. The same is seen in the spathella or proliferous perigynium at the base of the spiculæ. The existence of sterile squamæ at the base of the spiculæ is not constant. When present, they give a rigid aspect to them, as if supported on short pedicels. In some of Griffith's specimens they are generally absent, and in those specimens which have the male apex of the spiculæ long and broad, the resemblance to *C. condensata*, Nees, is striking. Whether the two plants are specifically distinct I have doubts. The colour of *C. Bengalensis* is lighter; the partial spikes never geminate; the upper squamæ smooth, and the perigynium is smoother, with stronger nerves and a longer rostrum. An authentic specimen of Roxburgh is in Herb. Banks.

The specimens figured are,—

Tab. CCXL. A specimen from Dr. Hooker from East Nepal, with simpler inflorescence, the perigynium and spathella showing what I believe to be the normal state of the orifice: one of the perigynia is morbidly enlarged; the purple spots are often indistinct.

Tab. CCXLI. A specimen from Dr. Hooker from East Nepal, with the perigynium spotted. That at *b.* and *c.* is from the younger specimen from the Juntea Hill, the perigynium closely investing the achenium.

Tab. CCXLII. A specimen from Griffith from Khasia, with the inflorescence more composite, the spiculæ with more numerous male florets; the rostrum longer, sometimes smooth, and a rachicola visible.

Tab. CCXLIII. A specimen from Hongkong, China, more rigid in habit, with turgid vaginæ to the bracts, and bracteolæ to the branches of the spikes; the orifice of the perigynium oblique and entire, as is often the case in the Indian specimens. The nerves of the perigynium and the ferruginous spots, especially observable on its inner surface, and the equal base of the style, separate it from *C. Indica*, L. It is probably the *C. valida* of Nees, and perhaps *C. cruciata*, Wahl. Act. 149 (not of Nees).

209. *C. raphidocarpa* (Nees); spica elongata viridi-ferruginea, e spicis partialibus 4–5 ambitu oblongo-ovato subduplicato-pinnatis composita, inferioribus remotis longe exserte pedunculatis, mediis geminis, rachi pilosa; spiculis latis squarrosis confertis basi flosculis fæmineis pluribus; bracteis vaginatis culmo brevioribus subtus vaginisque pilosis; stigmatibus 3; perigyniis patentibus vel recurvatis ellipticis triquetris longe rostratis, ore obliquo integro demum plus minus bifido, pallidis superne ferrugineis maculatis nervatis glabris vel ad margines sparsim pilosis, squama ovata acuta brevi hispido-aristata lineolis ferrugineis notata glabra latioribus plus duplo longioribus.—*C. raphidocarpa*, *Nees, apud Wight*, 122. (Tab. CCXLIV.)

HAB. In montibus Pulney, Penins. Ind. Or., *Wight*.

*Culmus*  $2\frac{1}{2}$ -pedalis, validus, firmus. *Folia* 3–4 lin. lata,



subtus vaginisque pilosa. *Bractea* vaginatae, culmo breviores. *Pedunculi*  $\frac{1}{2}$ –4 poll. longi, pilosi. *Spicae* 2–3 poll. longae, 10–15 lin. latae. *Spiculæ* 4–6 lin. longae, 4–5 lin. latae. *Squamæ* conformes. *Perigynium*  $2\frac{1}{2}$  lin. longum,  $\frac{4}{10}$ – $\frac{5}{10}$  lin. latum: rostro  $1\frac{3}{10}$  lin. longo. *Achenium* 1 lin. longum,  $\frac{4}{10}$  lin. latum, inæqualiter triquetrum, pallidum, stipitatum, basi styli æquali terminatum.

Affinis *C. thyrsoflora*, Boott, et *C. Lindleyana*, N. Differt speciebus majoribus, magis apertis; rachi pilosa; perigyniis minoribus, rostro longiori, sparsim piloso; foliis bracteisque subtus vaginisque pilosis.

210. *C. fissilis* (Boott); spica elongata stramineo-pallida, e spicis partialibus 5–6 ambitu ovato duplicato-pinnatis composita, inferioribus remotis longe exserte pedunculatis, rachi scabra; spiculis oblongo-lanceolatis apice parce masculis; bracteis vaginatis culmo longioribus; stigmatibus 3; perigyniis ellipticis longe rostratis bicuspidatis, laciniis acutis scabris, nervatis excurvis glabris vel marginibus sparsim denticulatis, squama late ovata obtusa subinde emarginata vel subacuta dorso scabra nervata straminea superne albo-hyalina longe hispidaristata angustioribus subduplo longioribus. (TAB. CCXLV.)

HAB. Anuteum, New Caledonia group, *Milne* (*Herb. Hooker*).

*Culmus* sub-2-pedalis. *Folia* 2–3 lin. lata. *Bractea* culmo longiores. *Spicae*  $1\frac{1}{2}$ –3 poll. longae,  $1$ – $1\frac{1}{2}$  poll. latae: spiculæ 4–6 lin. longae,  $1\frac{1}{2}$  lin. latae, bracteolis setaceis suffultæ. *Squamæ* masculæ glabræ. *Perigynium*  $1\frac{7}{10}$ –2 lin. longum,  $\frac{4}{10}$ – $\frac{5}{10}$  lin. latum, rostro  $\frac{8}{10}$  lin. longo. *Achenium*  $\frac{9}{10}$  lin. longum,  $\frac{4}{10}$  lin. latum, ellipticum, triquetrum, fuscum, basi styli apiculatum.

A *C. cruciata*, Nees, differt inflorescentiæ colore stramineo; spicis singulis; perigynio bicuspidato, margine sparsim denticulato; squamis fœmineis latioribus, brevioribus.

211. *C. spatiosa* (Boott); spica elongata pallide straminea concolori, e spicis partialibus 5–6 (ambitu ovato) subduplicato pinnatim compositis, inferioribus remotis longe exserte pedunculatis; spiculis laxis apice masculis subrotundis divaricatis; bracteis inferioribus latis elongatis longe vaginatis; stigmatibus 3; perigyniis ellipticis triquetris longe rostratis, ore oblique alte fisso, superne scabris marginibus serratis crebre nervosis arcte contiguis patentibus vel subdeflexis, squama lanceolata acuta vel obtusa emarginata pallida nervosa scabra longioribus. (TAB. CCXLVI.)

HAB. In Cochinchina, ad Touran, *Gaudichaud* (*Herb. Mus. Paris*).

*Culmus* sub-2-pedalis, triquetrum, basi foliosus; pars spicas gerens 9–18 poll. longa. *Folia* latissima, 8–10 lin. lata,  $\frac{1}{2}$ –2-pedalia, plana, mollia. *Bractea* inferiores 5–8 lin. lata: infima sæpe sterilis, culmum æquans: sursum breviores, demum obsoletæ. *Spicae* partiales 1–2 poll. longae et latae. *Spiculæ* sub-3 lin. longae et latae, sæpe basi squamis vacuis appressis instructæ, squamæ conformes; nisi fœmineæ infimæ subinde emarginatæ. *Perigynium* (cum rostro  $1$ – $1\frac{4}{10}$  lin. longo)  $2\frac{7}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum. *Achenium*  $1\frac{2}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, ellipticum vel oblongo-obovatum; basi styli incrassata.

Affinis *C. cruciata*, Nees; differt foliis bracteisque latis, etc.

I am indebted to M. Spach for the knowledge of this species. He tells me that Gaudichaud remarks on the ticket to the speci-

mens in the Paris Herbarium that the rachis and inflorescence are "colore lacteo insignes."

212. *C. condensata* (Nees); spica elongata ferruginea concolori, e spicis partialibus rarius singulis sæpius mediis vel inferioribus inæqualibus geminis (ambitu late ovato), inferioribus remotis longe exserte pedunculatis supradecompositis; spiculis oblongis copiosissimis apice flosculis masculis pluribus basi fœmineis 1–4 vel pluribus; bracteis inferioribus longe vaginatis elongatis; stigmatibus 3; perigyniis ovalibus vel ellipticis obtuse trigonis rostratis, marginibus superne serratis, ore oblique fisso bifido, rectis vel subexcurvis plerumque scabris leviter pauci-nervatis plus minus maculatis olivaceis vel fuscis, squama late ovata acuta vel obtusa emarginata cuspidata dorso scabra striata nervosa lineolis ferrugineis notata longioribus.—*C. condensata*, Nees, *Wight, Contr.* 123; *Kunth*, 509. (TAB. CCXLVII., CCXLVIII.)

Var.  $\beta$ ; inflorescentia simpliori.—*C. Indica*, Nees, 123 (*non Linn.*). (TAB. CCXLIX.)

HAB. In India orientali. Kumaon, *Wallich*, 3400 *b.* (*ex parte*). Mussorie, *Royle*, n. 83–89, etc. Almora, *Strachey and Winterbottom*, n. 924. Sikkim, *Dr. Hooker*.

A *C. Bengalensi*, Roxb., differt speciebus partialibus sæpius geminis, polystachyis, ferrugineis; perigyniis brevius rostratis, plus minus scabris; nervis tenuioribus, paucioribus; squamis scabris.

Nees founded his *C. condensata* on Royle's n. 83 and Wallich's 3400 *b.*, *ex parte*. I have figured authentic specimens of both.

Tab. CCXLVII. is a specimen, in flower, from Royle, n. 83. The "rachis sulphureo-hispidissima," as described by Nees, from the pollen diffused over it. The spiculæ have 1–3 female florets. From the spathella of one of the terminal spiculæ there is a pistillum with its stigmata projecting beyond the bifid apex, showing the nature of this organ as a proliferous ruptured perigynium, bearing occasionally the female organs beyond the usual floral axis.

Tab. CCXLVIII. A specimen from Royle, n. 89, more advanced, the spiculæ with 3 female florets, the squamæ and perigynium very rough, the nerves slight.

Tab. CCXLIX. A specimen from Wallich, n. 3400 *b.*, from Kumaon, with simpler inflorescence. This is the *C. Indica*, Nees (*not Linn.*). The perigynium and squamæ are from a more advanced specimen from Almora, Strachey and Winterbottom, n. 924, identical with Wallich's.

*C. condensata* has often a more diffuse and a less rigid habit of inflorescence than *C. Bengalensis*, and the rachis is very scabrous, and the geminate spikes common. The colour is ferruginous, the spiculæ without sterile basal squamæ, the female florets few, the squamæ as well as the perigynium, in some specimens very scabrous. The perigynium is  $1\frac{7}{10}$ – $\frac{8}{10}$  lin. long,  $\frac{6}{10}$  lin. broad, unequally triquetrous, the nerves about 2 or 3 on each face, always slight. The achenium is oval-triquetrous, 1 line long,  $\frac{1}{2}$  a line wide, and in the specimen of Strachey and Winterbottom it is of a pale straw-colour, faintly spotted, the apex white and somewhat cupped. In Royle's specimen it is more fully mature, of dark purple.

Though this species is common in India, the specimens, easily recognized, are generally too young to afford as satisfactory characters as those of *C. Bengalensis*. I have it thus undeveloped from Dr. Wight, from the Pulney Mountains; from Mr. Edgeworth, from "the Ulkagash range, 5–7000 feet;" Dr. Thomson, August 10, 1847, without any locality; Dr. Hooker, from Lachen. In Royle's *Herb.*, it has the numbers 83, 84, 85, and 89; and I think it is n. 2334 of Jacquemont's list.

From the specimens being generally young, and those of *C. Bengalensis* as generally old, it might be inferred that the dif-



ference between them, as we see them in herbaria, is merely that of age. That age modifies the character in *Carex* is evident, by often adding to the substance of the perigynium, affecting its roughness, frequently its form, colour, and degree of nervation, rendering it more or less turgid, and giving a rigidity to all parts of the plant; and in these puzzling paniculate species, it, and probably locality, give a greater or less luxuriance to the inflorescence, and influence the number of the female florets.

213. *C. Indica* (L.); spica longissima ferruginea, e spicis partialibus subdecem singulis, superioribus contiguis sessilibus (ambitu ovato) pinnatim, inferioribus (ambitu lanceolato) duplicato-pinnatim compositis remotis longe exserte pedunculatis stricte erectis longissime lateque bracteatis; spiculis lanceolatis subdimidiatis vel longius apice masculis basi flosculis fœmineis 2–7 instructis alternis divaricatis; stigmatibus 3; perigyniis ovalibus obtuse trigonis sæpe uno latere gibbosis rostratis, ore membranaceo integro oblique secto, æqualiter crebre valideque nervosis olivaceis glabris vel superne ad margines serratis arcte contiguis rectis vel subexcurvis, squama subrotunda obtusissima vel ovata acuta, plus minus longe aristata ferruginea margine apice albo-hyalina glabra striato-nervosa longioribus (aristâ) brevioribus.—*C. Indica*, *Lin. Mant.* 574 (*non aliorum*). (TAB. CCL.—CCLIII., et Var.  $\beta$ , TAB. CCLIV.)

HAB. Ceylon, *Thwaites*; *Stocks* (*Herb. Hooker*). Java, *Zollinger*, n. 311, 318 (*Herb. Mus. Paris*).— $\beta$ . Ile St. Georges, Archipel des Iles Salomon, *Hombroen* (*Herb. Mus. Paris*). Tenasserim, *Telfer* (*Herb. Hooker*). Feejee group, *Milne* (*Herb. Hooker*).

*Culmus* 3-pedalis, validus, obtusangulus, lævis, apice acutangulus, scaber, basi reliquiis foliorum fibratis, fuscis, foliisque vaginantibus tectus; pars spicas gerens fere tripedalis. *Folia* 5 lin. lata, culmum subæquantia. *Bractea* infima 5 lin. lata,  $2\frac{1}{2}$ -pedalis; superiores obsoletæ; vaginæ ima basi purpureæ. *Pedunculi* inferiores 7–10 poll. longi, apice scabriusculi. *Spicæ* partiales superiores 6, contiguæ, sessiles, ebracteatae,  $1\frac{1}{2}$  poll. longæ, subpollicem latæ, divaricatæ: inferiores  $2\frac{1}{2}$ –3 poll. longæ,  $1\frac{1}{2}$  poll. latæ: a se 5–10 poll. remotæ: infima subradicalis: erectæ, ferrugineæ, concolores, basi ramosæ: rami sessiles, 5-stachyi. *Spiculæ* 6–8 lin. longæ, basi 3 lin. latæ: omnes in spicis superioribus vel ad apicem spicarum inferiorum et in ramis pinnatim dispositæ, alternæ, divaricatæ: pars staminifera apicem dimidiam vel partem longiorem spiculæ occupans: basi flosculis fœmineis 2–7 instructæ: axis scaberrimus. *Squamæ* leviter striato-nervosæ, aliter 1-nervatæ: fœmineæ inferiores subrotundæ, obtusissimæ, longe aristatæ: superiores ovatæ, acutæ: masculæ ovato-lanceolatæ, acutæ vel mucronatæ. *Rachis* angulata, apice setose scaberrima. *Perigynium*  $1\frac{9}{10}$ – $2\frac{1}{10}$  lin. longum,  $\frac{7}{10}$ – $\frac{8}{10}$  lin. latum, plus minus turgidum, sæpe uno latere gibbosum; rostrum supra ejus basin tumidum. *Achenium* 1 lin. longum, vix  $\frac{6}{10}$  lin. latum, ovalitriquetrum, basi productum, faciebus apice convexis basi concavis, flavidum; basi styli persistente, columnari, bulboso-incrassata. *Stigmata* longa.

Var.  $\beta$ , *squamis* fœmineis truncatis emarginatis.

Linnaeus has afforded no evidence whence he received his *C. Indica*. A figure of his specimen from his herbarium in the Linnaean Society is given in Tab. CCL. I was for a long time in search among the various collections from the East Indies for specimens like it, and found none, till Sir W. Hooker sent me a plant collected by Mr. Thwaites, in Ceylon, from which I have made my description of the species. I have since seen, in Sir William's herbarium specimens, found in Ceylon by Mr. Stocks,

in Tenasserim by Helfer, and the Feejee group by Milne, and have been indebted to M. Spach for one from the Salomon Archipelago, found by Hombroen (*Voy. de l'Astrolabe et de la Zélée*); and also from Java, found by Zollinger. I can see no essential difference in these plants to justify their separation from the Ceylon one. No dependence can be placed, in this paniculate group, on the number of the female florets, nor on the form of the squamæ, which in what I have considered as a variety  $\beta$  have a broad truncate or emarginate apex, a character more or less observable in the Ceylon plant. In the Java plant the inflorescence is of a pale straw-colour, the partial spikes rather longer, and the spiculæ of the upper spikes often, and those of the lower always, sterile. In one large entire specimen I can only detect two perigynia; the female scales are acute, and the male *muticæ*, as they are occasionally in Stock's specimens from Ceylon.

Authors have applied the name of *C. Indica* to different plants. That of Lamarck, Wahlenberg, Willdenow, and Schkuhr, was from the Island of Bourbon; that of Kunth from the Mauritius; and that of Nees from the continent of India. A reference to the description of Linnaeus will show that the character given by these authors will not apply to the true *C. Indica*. The "panicula racemis patulis, cui insident spicæ patentes" of Linnaeus, is opposed to the "spicis ramis aggregatis" of Wahlenberg, and to the "corymbis coarctato-pinnatis" of Willdenow and Schkuhr. Schkuhr figures the perigynium as bifid, and Kunth describes it "rostrato bicuspidato." I therefore should confidently refer the *C. Indica* of Lamarck, Wahlenberg, Willdenow, Schkuhr, and Kunth, to *C. Wahlenbergiana*, Boott, and that of Nees to his own *C. condensata*.

The specimens figured are,—Tab. CCL., from *Herb. Linn.*! Tab. CCLI., from Ceylon, *Thwaites*. Tab. CCLII. and CCLIII., from Java, *Zollinger*. Tab. CCLII., the lower portion, and Tab. CCLIII. (the right-hand figure), the upper portion of the same specimen. Tab. CCLIV., var.  $\beta$ , from the Salomon Archipelago, *Hombroen*.

214. *C. Harlandi* (Boott); spicis 2–4 ex albido pallide olivaceis contiguis cylindricis erectis, terminali mascula gracili, reliquis 1–3 fœmineis vel apice parce masculis subcrassis, inferior subremota, omnibus vaginatis inserte pedunculatis; bracteis foliaceis culmo paulo longioribus; stigmatibus 3, sublævibus; perigyniis elliptico-lanceolatis sensim rostratis, ore albo obliquo bidentato, obtuse trigonis superne marginibus oreque scabriusculis crebre striato-nervosis pallide olivaceis, squama oblonga obtusa cuspidata alba nervo viridi latioribus subduplo longioribus. (TAB. CCLV.)

HAB. Hongkong, China, *Dr. Harland* (*Herb. Hooker*).

*Culmus* 6–14-pollicaris, triqueter, lævis; pars spicas gerens 2–7 poll. longa. *Folia* 10–14 lin. lata, culmo duplo longiora, glauco-viridia, crebre nervosa, marginibus scabris. *Bractea* vaginata, culmo paulo longior: infima 3 lin. lata: vel in culmis 1–2-stachyis angustæ, spiculis breviores. *Pedunculi* inserti. *Vaginæ* 3–16 lin. longæ. *Spica mascula* straminea,  $2\frac{3}{4}$  poll. longa, 1– $1\frac{1}{2}$  lin. lata: subinde abbreviata, 7 lin. longa. *Spicæ fœmineæ* 1–3, quandoque apice parce masculæ,  $1\frac{1}{2}$ –3 poll. longæ, 3–4 lin. latæ, masculæ arcte contiguæ, vel infima  $2\frac{1}{2}$  poll. remota. *Squamæ* ciliatæ; masculæ obtusæ, muticæ; fœmineæ inferiores, longius cuspidatæ. *Perigynium* 4– $4\frac{8}{10}$  lin. longum,  $\frac{9}{10}$ – $1\frac{2}{10}$  lin. latum, rostro demum medio tumente. *Achenium* stipitatum,  $2\frac{3}{10}$ –3 lin. longum, 1– $1\frac{1}{10}$  lin. latum, oblongo-obovatum, compresso-trigonum, angulis indentatis, parte styli inferiore persistente ( $\frac{8}{10}$  lin. longa), conspicue apiculatum: ejus apex crassior rimâ circulari basin styli deciduam bulbosam cingente. *Stigmata* 3, sublævia.

This fine species I have named after the late lamented Dr. Harland, to whom we owe its discovery. From the remarkable form of the achenium it is allied to *C. tenebrosa*, Boott.



215. *C. tenebrosa* (Boott); spicis 3–4 fusco-olivaceis elongatis erectis remotis, terminali mascula, reliquis foemineis apice subdimidiatis masculis, inferioribus longe exserte pedunculatis; bracteis vaginatis, spiculis suis brevioribus vel subaequantibus; stigmatibus 3, laevibus; perigyniis e basi acuta ovalibus obtuse triquetris sensim longe rostratis alte bicuspidatis marginibus superne serratis crebro-nervatis glabris fusco-olivaceis, squama late ovata obtusa truncata vel submarginata apice ciliata hispido-cuspidata subduplo longioribus. (TAB. CCLVI.)

HAB. Hongkong, China. Woods in the Happy Valley, *Dr. Harland*.

Fusco-olivacea! *Radix* fibris lignosis, lanuginosis vel laevibus, validis. *Culmus* 2–4-pedalis, gracilis, firmus, laevis, triqueter, inferne foliatus; pars spicas gerens 6–20 pollices longa. *Folia* 2–3 lin. lata, plana, firma, culmo longiora, fusco-olivacea. *Bractea* vaginatae, angustae; vagina infima 1½–3 poll. longa. *Pedunculus* infimus 4–8 poll. longus, scaber. *Spica* mascula 2–3½ poll. longa, 1½ lin. lata: reliquae 1½–3½ poll. longae, basi 6 lin. latae, apice conspicue masculae, a se 3–6 poll. remotae. *Squamae* omnes conformes, fuscae, punctis minutis nigrescentibus obscuratae. *Perigynium* 4½ lin. longum, 1 lin. latum. *Achenium* 2½ lin. longum, ⅓ lin. latum, atro-purpureum, ovale-triquetrum; angulis infra medium incis; basi styli persistente elongata apice annulata conspicue apiculatum. *Stylus* exsertus; ejus basis decidua, clavata. *Stigmata* fusca, laevia.

A *C. Bongardi*, Boott, differt stigmatibus insigniter glabris; colore omnium partium fusco; culmo graciliori, laevi; vaginis bractearum aequalibus; bracteis brevioribus; squamis latioribus, brevioribus.

216. *C. Japonica* (Thunberg); spicis 3–7 cylindricis, terminali mascula gracili sessili, foemineis subcrassis squarrosis olivaceis contiguis divergentibus densifloris sessilibus vel inferioribus pedunculatis; bracteis foliaceis culmo longioribus evaginatibus; stigmatibus 3, longis, aurantiacis; perigyniis ovalibus subtrigonis subventricosus in rostrum saepe apice serratum attenuatis, ore obliquo ciliato bidentato demum bifido vel bilobato, divergentibus vel etiam excurvatim-arcuatis nervatis, squama ovata truncata vel lanceolata acuta hispido-cuspidata alba nervo viridi latioribus longioribusque.—*C. chlorostachys*, *Don*, *Lin. Trans.* xiv. 330; *Prod. Fl. Nip.* 43. *C. Doniana*, *Spr. Syst.* 825; *Nees*, 128; *Kunth*, 503; *Drejer, Symb.* 26. t. 13. (TAB. CCLVII.)

Var. *β. minor*; spicis brevibus oblongis; culmo breviori; foliis angustis.—*C. Japonica*, *Thunb. Fl. Jap.* 38; *Wahl. Act.* 161; *Willd.* 270; *Schk. W. W. f.* 110; *Kunth*, 517.

HAB. In Japan, *Thunberg*, *Morrow*, *Wright*; et in Himalaya centrali et orientali tropica. Nipal, *Wallich*. Sikkim, alt. 1–2000 ped., *Dr. Hooker*.

Repens. *Culmus* 1–2-pedalis, acute triqueter, scaber, rigidus, basi foliosus; pars spicas gerens 3–5 poll. longa. *Folia* 3–5 lin. lata, plana, culmo longiora. *Bractea* evaginatae, inferiores late foliaceae, culmum longe superantes. *Spica mascula* 2–2½ poll. longa, 1–2 lin. lata, demum straminea. *Spica foeminea* 1–2½ poll. longae, 3½ lin. latae, omnes sessiles vel inferiores pedunculatae, evaginatae, infima subinde paulo remota. *Squamae masculae* lanceolatae, mucronatae; *foemineae* inferiores saepe obtusae, truncatae, hispido-cuspidatae, albae, nervo viridi in superioribus excurrente, subulato. *Perigynium* 2 lin.

longum, ⅓ lin. latum, glabrum vel apice scabrum; ore obliquo, demum bifido; laciniis obtusis vel acutis fimbriolatis. *Achenium* ⅓ lin. longum, ½ lin. latum, ellipticum, triquetrum, basi styli saepius recta vel obliqua, apiculatum. *Stylus* papuloso-velutinus. *Stigmata* longa, aurantiaca, laxa pilosella.

I am indebted to Dr. Gray for a specimen collected by Wright in Japan, in the North Pacific Exploring Expedition, which exactly resembles the figure given by Schkuhr of *C. Japonica*, and, like that figure, in a young flowering state. I have therefore adopted the name of Thunberg. Specimens collected by Dr. Morrow, and others by Wright in Japan, are identical with those from Nipal and Sikkim. The affinity of the species is with *C. Forsteri* and *C. Pseudocyperus*.

217. *C. alopecuroides* (Don); spicis 4–6 cylindricis densifloris contiguis pallidis, terminali mascula rarius basi mascula vix spicam foemineam supremam aequante, foemineis subgracilibus erectis squarrosis, inferioribus vel omnibus breve pedunculatis, una alterave interdum basi composita, infima subinde remota breve vaginata; bracteis anguste foliaceis culmum longe superantibus; stigmatibus 3, longis; perigyniis ovatis vel ovalibus obtuse trigonis in rostrum breve attenuatis superne ad margines serratis, ore albido bidentato vel bilobato, laciniis laevibus vel ciliatis nervatis divergentibus vel subarcuatis, squama ovata acuminata acuta hispido-cuspidata alba medio viridi dorso saepe scabra latioribus longioribus vel aequantibus.—*C. alopecuroides*, *Don*, *Lin. Trans.* xiv. 332; *Prod. Fl. Nip.* 43; *Nees*, 128; *Drejer, Symb.* 26. *C. Emodorum*, *Spr. Syst.* 818; *Kunth*, 516. (TAB. CCLVIII.)

HAB. In Himalaya centrali et orientali. Nipal, *Wallich*, *Griffith*. Sikkim, alt. 1–2000 ped., *Dr. Hooker*.

Repens. *Culmus* 1–2-pedalis, acute triqueter, scaber, rigidus, basi foliosus, vaginisque pallidis laceratis tectus; pars spicas gerens 1½–4 poll. longa. *Folia* 1–2 lin. lata, culmo longiora, marginibus revolutis. *Bractea* inferiores sublineam latae, culmum longe superantes, subinde breve vaginatae, basi transversim corrugatae. *Spica mascula* 1–1½ poll. longa, sublineam lata, sessilis, rarius apice foeminea. *Spica foeminea* 1–2½ poll. longae, 2 lin. latae, pallide olivaceae. *Squamae* omnes lanceolatae, acutae, hispido-cuspidatae. *Perigynium* 1½–1¾ lin. longum, ½ lin. latum; (dempto achenio) luci subjectum, intus punctis ferrugineis maculatum, lucidum, pallidum. *Achenium* perigynio laxa tectum, ⅓ lin. longum, ⅓ lin. latum, ovali-triquetrum, punctulatum, ferrugineum, basi styli obliqua vel depressa crassiore apiculatum. *Stylus* laevis.

*C. Japonica* arcte affinis! Differt foliis bracteisque angustioribus; spicis foemineis gracilioribus, erectis, subinde omnibus pedunculatis; squamis acutis; perigyniis minoribus nec ventricosus, ore rarius subobliquo, minus alte fisso, plerumque glabro; stylo laevi.

218. *C. Petitiana* (Richard); spicis 8 cylindricis longis crassis multi-densifloris subcomosis remotis ferrugineis, terminali basi mascula sessili, foemineis superioribus approximatis cernuis, inferioribus remotis longe exserte pedunculatis pendulis basi subattenuatis; bracteis inferioribus latis longe vaginatis culmo brevioribus; stigmatibus 3; perigyniis ovalibus vel ellipticis turgidis stipitatis sensim vel abrupte rostellatis, ore integro vel emarginato ciliato, pallidis, rostro ferrugineo, enerviis vel leviter nervatis pellucide demum undique ferrugineo-punctatis, squama lanceolata acuminata vel obtusa ab-



rupte longe valideque hispido-cuspidata ferruginea nervo viridi latoribus brevioribusque.—*C. Petiti*ana, *Rich. Fl. Abyss.* ii. 513. (TAB. CCLIX.)

HAB. In Abyssinia, in montibus provinciæ Onodgerate, *Ant. Petit.* Circa Demergui, ad rupes irriguas, alt. 11,000 ped., *Schimper, n.* 1038, *Nov.* 1852.

*Radix* crassa, lignosa, repens. *Culmus* 4-pedalis, validus, rigidissimus, triqueter, lævis, basi foliosus, rudimentis foliorum ferrugineis foliisque amplectentibus tectus; pars spicas gerens quandoque tripedalis. *Folia* 4–8 lin. lata, culmum subæquantia, rigidissima, plana, glauca, margine minime scabriuscula. *Bracteæ* inferiores 4–6 lin. latæ, spicis suis plus minus longiores, longe vaginatae: superiores angustæ, breves, demum evaginatae. *Vaginæ* inferiores 4–7 poll. longæ, basi ferrugineæ. *Pedunculi* inferiores 7–12 poll. longi, læves. *Spicæ* 2–4½ poll. longæ, 3–4 lin. latæ, terminalis (vel 3–4 superiores, *sec. Richard*) basi mascula: fœminæ superiores breviores, subsessiles, cernuæ; inferiores 7–9 poll. remotæ, pendulæ, basi subattenuatæ. *Squamæ* conformes. *Perigynium* (cum stipite  $2\frac{3}{10}$ – $3\frac{3}{10}$  lin. longo)  $1\frac{6}{10}$ – $2\frac{3}{10}$  lin. longum,  $\frac{6}{10}$ – $\frac{9}{10}$  lin. latum, enerve vel nervis tenuibus concoloribus inconspicuis notatum. *Achenium*  $\frac{9}{10}$  lin. longum,  $\frac{4}{10}$ – $\frac{5}{10}$  lin. latum, ellipticum, triquetrum, stipitatum, basi styli apiculatum.

*C. pendula*, Hudson, maxime affinis!, et pro ejus evolutione maxima forsan habenda. Differt spicis subcomosis, crassioribus, brevioribus, nec basi longe subverticillatim laxifloris, terminali vel terminalibus basi masculis; squamis longe cuspidatis; perigyniis majoribus; foliis rigidis, glaucis.

Variat spica terminali flosculis masculis fœmineisque per totam ejus longitudinem æque dispersis.

Drejer has nowhere, to my knowledge, expressed any opinion as to the group to which *C. pendula* belongs. He has merely remarked that it and *C. strigosa* are to be excluded from his *Hymenochlenæ*. I am always glad to lean on his authority. Both *C. pendula* and *C. Petiti*ana, with several American species, may, I think, be placed in a separate group with *C. strigosa*.

219. *C. Brasiliensis* (St. Hilaire); spicis 9 cylindricis crassis densifloris erectis alternatim contiguas ferrugineis concoloribus, terminali mascula, fœmineis evaginatiss, superioribus sessilibus, inferioribus breve pedunculatis bracteatis; bractea infima foliacea culmum longe superante; stigmatibus 3–2; perigyniis ellipticis vel oblongo-ovatis rostellatis, ore subintegro vel bilobulato ciliato, compressis vel inferne subtriquetris superne vacuis utrinque leviter nervatis glabris vel marginibus dentatis granulatis lineolis ferrugineis notatis, oclulis, squama ovata obtusa vel subemarginata breve hispido-cuspidata ferruginea angustioribus brevioribusque.—*C. Brasilensis*, *St. Hilaire, MSS.* (TAB. CCLX.)

HAB. In Brasilia australi, prov. Minaes, *St. Hilaire* (*Herb. Mus. Paris*).

*Culmus* 3–4-pedalis, acute triqueter, validus, superne scaber, basi vaginis rubro-ferrugineis tectus; pars spicas gerens 6 poll. longa. *Folia* 3 lin. lata, culmo breviora, glauca. *Bracteæ* evaginatae, superiores obsoletæ, infima subpedalis. *Pedunculus* infimus 8 lin. longus. *Spica* mascula 2 poll. longa, 3 lin. lata, breve pedunculata. *Spicæ* fœminæ  $\frac{1}{2}$ – $2\frac{1}{2}$  poll. longæ, 3 lin. latæ, obtusæ; *secunda* basi spiculis 2 brevioribus aucta, quasi ternata. *Squamæ* omnes conformes. *Perigynium* (vix maturum)  $1\frac{6}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, compressum vel inferne subtriquetrum. *Achenium*  $\frac{8}{10}$ –1 lin. longum,  $\frac{1}{2}$  lin. latum, oblongo inæqualiter trigonum vel lenticulare, sæpe uno

angulo indentatum, basi styli apiculatum, pallidum. *Stylus* medio crassiusculus. *Stigmata* 3 vel 2.

*C. glaucescenti*, Ell., affinis. Differt perigyniis compressis, minoribus, oclulis, lineolis notatis.

I am indebted to M. Spach for the knowledge of this species, which, as far as I know, has only been found by M. St. Hilaire. It belongs to the *Æorostachyæ* of Drejer.

220. *C. glaucescens* (Elliott); spicis 4–7 cylindricis approximatis, terminali mascula ferruginea, fœmineis ima basi sæpe apice masculis evaginatiss superioribus contiguas sessilibus erectis vel infima subremota longe exserte pedunculata vel omnibus pedunculatis pendulis; bracteis angustis, infima subinde breve vaginata culmo longiore; stigmatibus 3, rarius 2; perigyniis ovatis vel ovalibus triquetris marginibus acutis, vel turgide rotundato-obovatis ventricosis, rostellatis, ore integro vel bidentato, granulatis obsolete vel leviter vel valide nervatis glaucis demum fusco-brunnescentibus glabris divergentibus, squama ovata vel oblonga emarginata vel truncata hispido-aristata rubro-ferruginea medio viridi nervata latoribus longioribus vel aristâ brevioribus.—*C. glaucescens*, *Elliott*, 553; *Dewey*, xi. 150; *Schw. et Tor.* 356; *Tor. Mon.* 425; *Kunth*, 492; *Drejer, Symb. p.* 14. t. 3; *Chapman*, 542. *C. verrucosa*, *Muhl.* 261; *Elliott*, 555; *Kunth*, 460; *Dewey*, xi. 159. *C. glandulosa*, *Elliott, Herb.* (*fide Curtis*). *C. sempervirens*, *Schw. An. Tab.* *C. inundata*, *Willd. Herb.*; *Schlechtendal, Linnea*, x. 267. *C. glauca*, *Bosc. in Herb. Vahl* (*fide Drejer*). (TAB. CCLXI.)

Var.  $\beta$ . androgyna, *Curtis, Sill.* xlv. 84.—*C. verrucosa*, *Dewey*, xlviii. 140; *Chapman*, 542. (TAB. CCLXII.)

Var.  $\gamma$ . polystachya, *Curtis, Sill.* vii. 410 (1849). (TAB. CCLXIII.)

HAB. In America septentrionali. Carolina to Florida.

*Culmus* 2–3-pedalis vel altior, acute triqueter, validus, superne scaber, basi foliosus, rudimentis foliorum lucidis vaginisque membranaccis ferrugineis laceratis tectus; pars spicas gerens 4–10 poll. longa. *Folia*  $1\frac{1}{2}$ –3 lin. lata, clongata, apice longe setaceo-attenuata, culmo longiora vel breviora, glauca, carinata, marginibus scaberrima. *Bracteæ* angustæ, evaginatae: vel infima breve vaginans, culmo plerumque longior: superiores setaceæ, sursum spicis suis breviores. *Vagina* 3–7 lin. longa, intus ferruginea maculata. *Pedunculi* setacei,  $\frac{1}{2}$ – $2\frac{1}{2}$  poll. longi, vel inferiores validi, rigidi, sursum obsoleti. *Spica* mascula  $1$ – $2\frac{1}{2}$  poll. longa,  $2$ – $3\frac{1}{2}$  lin. lata, quandoque subsessilis vel longe pedunculata: altera rarius prope sita, 4 lin. longa, sessilis. *Spicæ* fœminæ 9 lin.– $2\frac{1}{2}$  poll. longæ,  $2$ – $3\frac{1}{2}$  lin. latæ: ima basi parce masculæ, sæpe flosculis masculis apiculatæ: omnes erectæ, alternatim approximatae: superiores sessiles, vel omnes longiuscule pedunculatae, pendulæ. *Squamæ* conformes, persistentes. *Perigynium*  $1\frac{6}{10}$ –2 lin. longum,  $1\frac{1}{10}$ – $\frac{5}{10}$  lin. latum; formâ, nervatione oreque varians, achenium arcte vel laxissime vestiens; ore plane integro vel bidentato, dentibus apertis: nunc obscure vel leviter vel costato-nervatum; nervis sæpe pallidioribus, conspicuis: semper tenuissime granulatum, quasi pruinatum, glaucum, demum fusco-ferrugineum vel brunneum. *Achenium*  $1\frac{1}{10}$ – $\frac{3}{10}$  lin. longum et latum, angulis conspicue prominentibus, faciebus concavissimis: vel ovale,  $1\frac{5}{10}$ – $\frac{7}{10}$  lin. longum,  $\frac{9}{10}$ –1 lin. latum, angulis minus prominentibus, faciebus concavis. In utraque forma angulis ad medium incrassatis.

We are indebted to Dr. Torey and Mr. Curtis for settling the synonymy of this very beautiful species. No author has noticed the male florets at the base of the female spikes, which I find in the



typical form and in the varieties. Mr. Curtis first noticed these variations, in Silliman's Journal, xlv. p. 84. His  $\beta$  *androgyna* (Tab. CCLXII.), he says, "is an autumnal variety, flowering in October, quite polymorphous. The common typical form has but one male spike; sometimes two or more, and then it is the *C. verrucosa* of Elliott." In Silliman, vii. p. 410, he describes his var.  $\gamma$  *polystachya* (Tab. CCLXIII.). "Spikes 8-12, small, nodding, mostly staminate at the apex. Like the var.  $\beta$ , it is an autumnal variety, but much smaller and less showy than the other forms, and is apparently produced by having been cropped early in the season by cattle. It grows by the margins of ponds at Society Hill, South Carolina." The modifications of form in the perigynium I have observed in all the specimens.

Drejer, I think, correctly places it in his *Æorostachya*; Tuckerman, evidently with some doubts, inserts it in his *Acutæ*, considering it allied to *C. glauca*, but he adds, "conf. *C. limosam*." The emarginate aristate squama, and the occasional occurrence of 2 stigmata, I think justify Drejer in his arrangement.

The specimens figured in Tab. CCLXI. are (7 spikes) from Alabama, and (6 spikes) from Florida; in Tab. CCLXII. and CCLXIII., from Carolina (Curtis).

221. *C. turgescens* (Torrey); spicis 3-4 contiguis vel distantibus, terminali mascula cylindrica gracili breve pedunculata pallida, fœmineis subrotundis vel oblongis crassis squarrosis aureis, suprema sessili, infima sæpe remota longe exserte pedunculata; bracteis culmo plus minus longioribus vel infima eo brevior; stigmatibus 3, aurantiacis; perigyniis ovato-lanceolatis subinflatis sensim rostratis, ore membranaceo emarginato plerumque obtuso ciliato, glabris crebre nervosis demum horizontalibus aureis concoloribus, squama late ovata acuta albida medio pallide viridi nervata plus duplo longioribus.—*C. turgescens*, *Tor. Mon.* 419 (*excl. C. folliculata*, *Ell.*); *Dewey*, iii. 356; *Sartwell*, *Ews. n.* 144; *Chapman*, 544. (TAB. CCLXIV.)

HAB. In America septentrionali. S. Carolina. Georgia and Alabama. Louisiana.

*Radix* fibris longissimis. *Culmus* subtripetalis, gracillimus, firmus, obtusangulus, lævis, inferne foliatus, basi vaginis foliorum pallidis tectus; pars spicas gerens 2-8 poll. longa. *Folia* 1-2 lin. lata, culmo breviora, carinata, firma. *Bractea* (nisi summa interdum abbreviata) foliaceæ, nunc culmum longe superantes, vel infima eo brevior vel subæquans, sæpe longe vaginans. *Vagina* infima 3-18 lin. longa. *Pedunculus* infimus 4 lin. ad 4 poll. longus, lævis, filiformis. *Spica mascula*  $\frac{1}{2}$ -1 $\frac{1}{2}$  poll. longa, 1-2 lin. lata, utrinque acuta, nuda vel bracteata. *Squama masculæ* pallidæ, obtusæ, margine membranaceæ, sæpe lineolis ferrugineis sparsis notatæ. *Spica fœmineæ* 6-11 lin. longæ, 5-7 lin. latæ, 6-15-floræ, summa plerumque sessilis, evaginata, vel binæ superiores breve pedunculatæ, spicæ masculæ arcte contiguæ; infima subinde 8 poll. remota, longe exserte pedunculata, cernua. *Perigynium* 4-4 $\frac{1}{2}$  lin. longum, 1 $\frac{2}{3}$ -1 $\frac{5}{6}$  lin. latum, subcoriaceum, rostro rarius parce dentato oreque subobliquo, nervis concoloribus. *Achenium* 1 $\frac{5}{10}$ -1 $\frac{8}{10}$  lin. longum, 1 lin. latum, ovali-triquetrum, ferrugineum, facibus concaviusculis, basi styli persistente paulo crassiore apiculatum.

I am indebted to Mr. Carey for specimens of this plant, which I suspect has occasionally been confounded with *C. Elliottii*, from which it is very distinct, not only in the colour and texture of the perigynium, but in the absence of male florets on the female spikes, and the distinct vaginæ to the bracts. Mr. Carey in eighty-three specimens found three with 2 spikes, sixty-five with 3, and fifteen with 4; all with one male. Its affinity is with *C. folliculata*, L., which species, Mr. Curtis tells me, is the plant so named by Elliott. Torrey had suspected that the *C. folliculata* of Elliott might prove to be *C. turgescens*, Torrey.

222. *C. Elliottii* (Schw. et Tor.); spicis 3-4, terminali mascula cylindrica pedunculata straminea, fœmineis apice masculis subrotundis crassis squarrosis olivaceis contiguis vel approximatis sessilibus evaginatibus vel infima inserte, rarius remota longe exserte, pedunculata cernua; bracteis culmo subduplo longioribus; stigmatibus 3, brevibus; perigyniis ovalibus inflatis subtriquetris sensim in rostrum breve attenuatis glabris vel superne parce dentatis, ore bifido, antice plurinerviis divergentibus olivaceis reticulato-punctulatis, squama ovata subacuta vel rotundata obtusa ciliolata albo-hyalina medio viridi nervata latioribus subduplo longioribus.—*C. Elliottii*, *Schw. et Tor.* 357; *Tor. Mon.* 418; *Dewey*, xi. 151; *Kunth*, 499; *Sartwell*, *Ews. n.* 141; *Chapman*, 544. *C. fulva*?, *Muhl.* 246. *C. castanea*, *Ell.* 546. *C. Baldwinia*, *Dewey*, 26, 107! (*fide spec. ab auctore*). (TAB. CCLXV.)

HAB. In America septentrionali. N. Carolina to Florida.

*Culmus* 2-petalis, gracilis, triqueter, rigidus, apice scabriusculus, basi foliatus, rudimentisque foliorum vaginisque purpureis tectus; pars spicas gerens plerumque 2 $\frac{1}{2}$ -3 poll. longa. *Folia* 1-1 $\frac{1}{2}$  lin. lata, culmum subæquantia, linearia. *Bractea* 1 lin. latæ, erectæ, culmo longiores, nisi infima, evaginata. *Vagina* 2 lin. longa. *Spica mascula* subpollicaris, 1-2 lin. lata, breve pedunculata, nuda vel bractea lanceolata breviori suffulta. *Squama masculæ* lanceolatæ, stramineæ, margine albo-hyalinæ, obtusæ. *Spica fœmineæ* 6-8 lin. longæ et latæ, apice masculæ: infima breve vaginata, inserte pedunculata, vel remota, longe exserte pedunculata, cernua (*Torrey, etc.*). *Perigynium* 3 $\frac{2}{3}$  lin. longum, 1 $\frac{1}{2}$  lin. latum, postice 4-5-nerviis. *Achenium* 1 $\frac{2}{3}$  lin. longum,  $\frac{7}{10}$  lin. latum, ovali-triquetrum, punctulatum, ferrugineum, basi styli æquali apiculatum.

I have never seen specimens having the remote cernuous lower spike, as described by Torrey, Elliott, and Muhlenberg. As to its affinity, I think it is more allied to *C. intumescens* than *C. folliculata*, Lin.

223. *C. Schweinitzii* (Dewey); spicis 4-6 cylindricis approximatis densifloris demum stramineis, terminalibus 1-2 masculis vel inferiori basi vel medio et basi fœminea bracteata, fœmineis evaginatibus vel inferioribus exserte pedunculatis cernuis sæpe basi compositis; bracteis inferioribus latis vaginatis culmum longe superantibus; stigmatibus 3, brevibus; perigyniis oblongo-ovatis vel ovalibus inflatis in rostrum tenue acuminatis, ore subobliquo bifido, glabris leviter parce nervatis membranaceis divergentibus pallide stramineis, squama lanceolata acuta longe hispido-aristata albida nervo viridi latioribus longioribus vel aristam subæquantibus.—*C. Schweinitzii*, *Dewey*, ix. 68; *Schw. et Tor.* 366; *Carey*, 533; *Kunth*, 518; *Sartwell*, *Ews. n.* 151. (TAB. CCLXVI.)

HAB. In America septentrionali. Canada to New Jersey.

*Culmus* subpedalis, triqueter, obtusangulus, superne acutangulus, scabriusculus, mollis, inferne foliatus; pars spicas gerens 4-8 poll. longa. *Folia* 2-5 lin. lata, culmo breviora, flaccida. *Bractea* inferiores 2-4 lin. latæ, plerumque plus minus vaginatæ, culmo longiores, infima nunc pedalis. *Vagina* infima 3-15 lin. longa. *Pedunculus* infimus  $\frac{1}{2}$ -2 poll. longus. *Spica mascula* 15-24 lin. longa, 1-2 lin. lata, pedunculata, altera paulo remota, sessilis, 6-14 longa, sæpe basi vel medio et basi fœminea, rarius spica suprema apice et basi mascula. *Squama masculæ* pallide ferrugineæ, lanceolatæ, acutæ vel cuspidatæ, margine albo-hyalinæ. *Spica fœmineæ*



9 lin.— $3\frac{1}{4}$  poll. longæ, 4–6 lin. latæ: inferiores pedunculatæ, cernuæ: omnes evaginatæ, vel infima vel binæ inferiores exserte pedunculatæ; infima quandoque 3 poll. remota; inferiores sæpe basi ramulis brevibus, e perigynio egredientibus, compositæ. *Perigynium*  $2\frac{7}{10}$ – $3\frac{2}{10}$  lin. longum,  $\frac{7}{10}$ – $\frac{9}{10}$  lin. latum. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, ovali-triquetrum, ferrugineum, basi styli apiculatum, stylo supra contorto.

The more immediate affinity of this species, from the aristate squamæ and vaginate bracts, is with *C. tentaculata* rather than *C. vesicaria*, L. I should infer, from the few specimens I have seen, that it is not so common as several of its allies.

224. *C. rostrata* (Michaux); spicis 3–4 approximatis demum flavidis, terminali mascula elliptica inconspicua subsessili, fœmineis subrotundis contiguis squarrosis, inferioribus vaginatis, infima subinde plus minus remota exserte pedunculata erecta; bracteis angustis (nisi summa) vaginatis culmo sæpius multum longioribus; stigmatibus 3, aurantiacis; perigyniis lanceolatis obtuse triquetris basi contractis in rostrum longum lineare scabrum attenuatis, ore bifido, crebre nervosis inferioribus demum horizontaliter patentibus flavidis, squama ovata acuta vel obtusa mutica æquilata pallide ferruginea nervo viridi subduplo longioribus.—*C. rostrata*, *Mich.* ii. 173; *Dewey*, xxxix. 52. *Sartwell*, *Evs. n.* 143 (non *Muhl.*, *Hoppe*, *With.*). *C. xanthophysa*,  $\beta$  et  $\gamma$ , *Dewey*, xiv. 353 (1828). (TAB. CCLXVII.)

HAB. In America septentrionali et Asia. Canada, *Mich.* Base of the White Mountains. N. Hampshire. Lake Avalanche. New York. Kamtschatka (*Fischer*). Japan (*Wright*).

*Culmus* 12–15-pollicaris, gracilis, obtusangulus, lævis, inferne foliatus; pars spicas gerens 1–5 poll. longa. *Folia* sublineam lata, culmo breviora. *Bracteæ* angustæ. *Vagina* infima 3–12 lin. longa. *Pedunculus* infimus  $\frac{1}{3}$ –2 poll. longus. *Spica mascula* 6 lin. longa, 1 lin. lata, ferruginea, spicam supremam fœmineam vix æquans. In speciminibus Japonicis nunc longior pedunculata. *Squamæ masculæ* lanceolatæ, acutæ, muticæ. *Spicæ fœmineæ* 7–8 lin. longæ et latæ, vel 2 masculæ arcte contiguæ, inferior inserte pedunculata: vel 3, infima  $1\frac{1}{2}$ –3 poll. remota, plus minus longe exserte pedunculata, erecta. *Perigynium* 5– $5\frac{1}{2}$  lin. longum,  $\frac{8}{10}$  lin. latum. *Achenium*  $1\frac{4}{10}$  lin. longum, fere  $\frac{8}{10}$  lin. latum, ovali-triquetrum, angulis obtusis, faciebus superne convexiusculis, stylo superne contorto.

This delicate species differs from its allies in its contracted inflorescence, narrow triquetrous perigynium, with its long linear rostrum and muticous scales. It is a more gracile plant than the var.  $\beta$  of *C. folliculata*, the spikes smaller, with fewer and more compact flowers. The perigynia in Tab. CCLXVII. that are underscored are from the original specimens of Michaux, in the Herb. Mus. Paris. Kunth however quotes the *C. rostrata*, Mich. (from an original specimen), under *C. xanthophysa*, a species not noticed in the Fl. Bor. Americana. I infer that he must have been misled by the general resemblance of *C. rostrata* to that plant.

225. *C. folliculata* (L.); spicis 4–5 demum flavidis remotis, terminali mascula elliptica vel oblonga pedunculata bracteata, fœmineis crassis ovatis vel subrotundis squarrosis sæpe longe distantibus, omnibus vel inferioribus exserte pedunculatis erectis; bracteis latis foliaceis vaginatis, omnibus (nisi interdum infima) culmum longe superantibus vel (nisi summa) eo brevioribus; stigmatibus 3, brevibus aurantiacis; perigyniis elongatis lanceolato-

ovatis inflatis in rostrum breve sensim acuminatis, ore bifido, marginibus superne serratis crebre nervosis subcoriaceis, inferioribus horizontaliter patentibus demum flavidis, squama ovato-lanceolata acuminata acuta longe hispido-aristata albida medio viridi nervata carina sæpe scabra longioribus vel aristam subæquantibus.—*C. folliculata*, L.; *Elliott*, 545; *Torrey*, *Mon.* 419; *Gray*, *Ann. Lyc. N. York*, iv. 235; *Carey*, 532; *Sartwell*, *Evs. n.* 142 (non *Wahl.*; *Willd.*; *Schk.*; *N.*; *Kunth*; *Dewey*, x. 32; *Schw. et Tor.*, quæ *C. intumescens*, *Rudge*). *C. folliculata*,  $\beta$ , *Muhl.* 244. *C. xanthophysa*, *Wahl. Act.* 152; *Kunth*, 500; *Dewey*, vii. 274 et xiv. 353; *Schw. et Tor.* 339. *C. louchicarpa*, *Willd. Herb.* (fide *Kunth*). (TAB. CCLXVIII.)

HAB. In America septentrionali. Northern and Middle States, in cedar swamps — VAR.  $\beta$ . Southern States. (TAB. CCLXIX.)

*Culmus* 2–4-pedalis, obtuse triquetus, firmus, apice scabriusculus; pars spicas gerens 7–24 poll. longa. *Folia* 3–5 lin. lata, culmo breviora. *Bracteæ* vaginantes, latæ, in speciminibus inflorescentiâ elongatâ omnes nisi summa culmo breviores. *Vaginæ* inferiores 1–2 poll. longæ. *Pedunculi* 1–5 poll. longi, seabri. *Spica mascula* 6–11 lin. longa, 2 lin. lata, plus minus (sæpius breve) pedunculata, interdum spicam supremam fœmineam vix superans. *Spicæ fœmineæ* sub 9–12 lin. longæ et latæ, a se sæpe 3–8 poll. remotæ, suprema vel binæ superiores inserte vel omnes exserte pedunculatæ. *Squamæ* omnes hispido-aristatæ. *Perigynium*  $5\frac{1}{2}$ – $6\frac{8}{10}$  lin. longum,  $1\frac{2}{10}$ – $\frac{6}{10}$  lin. latum. *Achenium*  $1\frac{8}{10}$ –2 lin. longum,  $\frac{9}{10}$ – $1\frac{1}{10}$  lin. latum, ovali-triquetrum, angulis obtusis faciebus concaviusculis, ferrugineum, lucidum, basi styli apiculatum.

Var.  $\beta$ ; culmo graciliori breviori, foliis bracteisque angustioribus; spicis longioribus, fœmineis laxi-plurifloris; perigyniis angustioribus vix inflatis laxis omnibus demum horizontaliter patentibus basi contractis glabris vel superne serratis, ore obliquo nunc subintegro; squamis ovatis acutis brevioribus muticis vel breve cuspidatis; achenio minori.—*C. folliculata*, *Elliott*, 545; *Chapman*, 544.

Drejer considers this noble species to be the full evolution of his *Spirostachya*, passing through it into *Physocarpæ*. The var.  $\beta$  is no doubt the *C. folliculata* of Elliott, as Mr. Curtis remarks to me that “the southern form has short scales.”

226. *C. subulata* (Michaux); spicis 4–6 paucifloris pallide viridibus remotis, terminali mascula parva ovali breve pedunculata, fœmineis apice sterilibus laxis squarrosis magis latis quam longis vaginatis, inferioribus inserte vel exserte pedunculatis; bracteis vaginatis, nisi extremis culmo longioribus; stigmatibus 3, brevibus; perigyniis anguste subulatis elongatis basi contractis in rostrum longum lineare attenuatis postice alte sulcatis bicuspidatis, cuspidibus acutis deorsum reflexis, viridibus glabris nervatis horizontaliter patentibus demum deflexis punctisque ferrugineis maculatis, squama ovata acuminata acuta cuspidata alba nervo viridi æquilata subtriplo longioribus.—*C. subulata*, *Mich.* ii. 173; *Schw. et Tor.* 340. t. 26; *Carey*, 532; *Kunth*, 500; *Kunze*, 157. t. 40; *Sartwell*, *Evs. n.* 145; *Tor. Mon.* 419 et 443; *Chapman*, 543. *C. Collinsii*, *Nuttall*, 205. *C. Michauxii*, *Dewey*, x. 273. (TAB. CCLXX.)



HAB. In America septentrionali. Canada to North Carolina, in cedar swamps.

*Culmus* 1-2-pedalis, debilis, obtusangulus, lævis, basi vaginis foliorum rubro-purpureis tectus; pars spicas gerens 3-9 poll. longa. *Folia* 1-2½ lin. lata, culmo breviora, graminea. *Bractea* summa setacea, spicam suam vix æquans: aliæ foliaceæ. *Vagina* 3-15 lin. longæ. *Pedunculus* infimus 1-2 poll. longus. *Spica mascula* 3-5 lin. longa, vix 1 lin. lata, pallida, pedunculo 1-10 lin. longo suffulta. *Spicæ fæmineæ* 1-11-floræ, 3-6 lin. longæ, 8-10 lin. latæ: summa subinde 1-2-flora, sessilis, evaginata: vel omnes vaginatae, apice extremo steriles vel masculæ, superiores contiguæ vel omnes 1-4 poll. remotæ, inferiores plus minus longe exserte pedunculatæ, erectæ. *Squamæ* omnes acutæ, cuspidatæ. *Perigynium* 5 $\frac{5}{10}$ -7 $\frac{7}{10}$  lin. longum, 1 $\frac{6}{10}$  latum. *Achenium* 1 $\frac{3}{10}$  lin. longum, ½ lin. latum, lineari-triquetrum, faciebus convexis, stylo contorto, basi ejus recta apiculatum.

This delicate species, which Torrey remarks is never of a yellow colour, is peculiar in the deep sulcus of the rostrum and the subulate reflexed laciniae of the orifice of the perigynium, a character not noticed by Richard. It was not known to Muhlenberg. Mr. Curtis has met with it in North Carolina.

227. *C. Shortiana* (Torrey); spicis 4-5 rarius 3-6 androgynis basi masculis cylindricis vel oblongis arrectis densifloris alternatim contiguis, inferioribus pedunculatis evaginatibus aurantiacis demum fusco-brunneis; bracteis inferioribus foliaceis, infima culmum subæquante; stigmatibus 3; perigyniis subrotundo-obovatis ventricosiss superne compressis abrupte rostellatis, ore integro vel emarginato, marginibus acutis glabris enerviis horizontaliter divergentibus sæpe subexcurvis transversim corrugatis stipitatis, squama ovata vel elliptica mucronulata medio viridi trinervi margine ferruginea latioribus longioribus vel subæquantibus.—*C. Shortiana*, *Torrey*, *Dewey*, 30, 60 (1836); *Drejer*, *Symb.* 12. t. 1; *Carey*, 520; *Sartwell*, *Ess.* n. 64. *C. Shortii*, *Tor. Mon.* 407 (non *Steud.*). *C. aporandra*, *Kunze*, *MSS. in Herb. Hooker.* (TAB. CCLXXI.)

HAB. In America septentrionali. Pennsylvania to Virginia, Ohio, Illinois.

*Culmus* 1-3-pedalis, triqueter, rigidus, scabriusculus, inferne foliatus, basi rudimentis foliorum fusco-purpureis vaginisque ferrugineis tectus; pars spicas gerens 2-6 poll. longa. *Folia* 2-4 lin. lata, superiora culmo longiora, pallide viridia, demum flavida. *Bracteæ* evaginatæ, inferiores (vel infima solum) foliaceæ, culmo longiores vel breviores: superiores setaceæ, spicis suis breviores. *Pedunculus* infimus ¼-2½ poll. longus, scaberrimus. *Spicæ* ½-1½ poll. longæ, 2-2½ lin. latæ: summa sæpe basi subdimidiatim mascula, reliquæ parcius masculæ, omnes alternat imcontiguæ, vel infima paulo remota quandoque cernua: obtusæ vel flosculis abortivis apiculatæ. *Squamæ* conformes, masculæ longiores, obtusæ, muticæ. *Perigynium* 1 $\frac{1}{10}$ -3 $\frac{3}{10}$  lin. longum, 1 $\frac{9}{10}$ -1 $\frac{1}{10}$  lin. latum. *Achenium* 7 $\frac{7}{10}$ -9 $\frac{9}{10}$  lin. longum, ½ lin. latum, ovali-triquetrum, faciebus convexiusculis punctulatum, fusco-ferrugineum, angulis pallidioribus, basi styli brevis oblique deciduâ.

We are indebted to Dr. Short for this beautiful species, who discovered it in Kentucky; and it was named after him by Dr. Torrey, whose name is the more appropriate. Dewey, however, alone published it in 1836, under the name of *C. Shortiana*, Torrey. Drejer was inclined to place it in his *Melananthæ*, near *C. Mertensii*, an affinity which Torrey also recognizes. If the inflorescence is alone to be considered, that affinity is evident; but I

rather incline to the opinion of M. Spach, who in a note to me remarks, that the "proxima affinitas est cum *C. glaucescente*, Elliott." The remarkable diaphanous tenuity of the perigynium in *C. Mertensii*, and its deep-coloured squamæ, separate it from *C. Shortiana*, and ally it to *C. Banksii*.

228. *C. debilis* (Michaux); spicis 4-5 rarius 6 cylindricis gracilibus pedunculatis pallidis, terminali tenui mascula vel apice extremo fœminea, reliquis fœmineis laxifloris longe setaceo exserte pedunculatis nutantibus, inferioribus remotis basi sparsifloris interdum compositis; bracteis vaginatis culmo longioribus vel brevioribus; stigmatibus 3; perigyniis fusiformibus plus minus sub-turgidis utrinque acutis sessilibus rostratis, rostro apice albo-hyalino margine sæpe scabro, ore obliquo bilobo (laciniis membranaceis obtusis ciliatis), tenuiter nervatis nervis sæpe superne evanidis vel inconspicuis pellucide punctatis viridibus demum castaneis vel olivaceis ferrugineo-punctatis, squama albida vel ferrugineo-tincta oblonga obtusa mutica, nervo viridi scabro infra apicem late albo-hyalinam ciliatam evanescente, vel ovata rarius lanceolata acuta vel cuspidata latioribus plus minus longioribus.—*C. debilis*, *Mich.* l. c. ii. 172 (1803); *Tor. Mon.* 416; *Carey*, l. c. 527; *Darlington*, *Fl. Cest. ed.* 3. 352; *Chapman*, 541; *C. tenuis*, *Rudge*, *Lin. Trans.* vii. 97. t. 9. fig. 2 (1804). *C. flexuosa*, *Muhl.* 253; *Willd.* iv. 297 (1805); *Schk. f.* 124; *Kunth*, 471; *Dewey*, *Sill.* x. 40; *Schw. et Tor.* 351. (TAB. CCLXXII.)

HAB. In America septentrionali, in sylvis humidis et pratis. Norway House, *Richardson*. New England to Pennsylvania and south-westward, *Carey*. Mountains of Carolina and Georgia, *Buckley*.

Var.  $\beta$ ; spicis 5-7 erectis, terminali mascula vel medio vel basi vel apice et basi mascufa, fœmineis linearibus angustis flosculis alternatim dispositis, inferioribus sæpe basi compositis; perigyniis brevioribus, rostro rarius scabro, squama oblongo-ovata obtusa vel acuminata acuta mutica ciliata subæquilata longioribus. (TAB. CCLXXIII.)

HAB. New York, *Sartwell*, *Ess.* n. 118. Pennsylvania, *Townsend*.

Var.  $\gamma$ ; spicis 4-5 ferrugineis, terminali mascula albida, reliquis fœmineis, inferioribus basi laxifloris erectis vel nutantibus; perigyniis angustioribus longioribus, rostro apice alte albo-hyalino sæpe scabro, ferrugineo-punctatis, squama lanceolata obtusa ciliata vel infima acuminata acuta rarius cuspidata albida, nervo viridi scabro plus duplo longioribus. (TAB. CCLXXIV.)

HAB. Louisiana, *Dr. Hale*. New Orleans, *Drummond*, n. 435.

Var.  $\alpha$ . *Culmus* 1-2-pedalis, debilis, apice setaceus, scaber, basi rudimentis foliorum purpureis glabris vel puberulis tectus; pars spicas gerens 5-16 poll. longa. *Folia* 1-2 lin. lata, culmo breviora vel æquantia, supra scabra, vaginæque inferiores sæpe puberulæ. *Bracteæ* (nisi suprema) vaginatæ, omnes sæpius culmo longiores. *Vagina* infima 1-2½ poll. longa, intus sæpe (sub lente) puberula: suprema plerumque obsoleta. *Pedunculi* setacei, scabri: infimus interdum 5-6 poll. longus. *Spica* terminalis mascula, 8 lin. ad 2 poll. longa, ½ lin. lata, basi laxiflora, pedunculata: sæpe apice extremo fœminea. *Spicæ fæmineæ* 1-2½ poll. longæ, 1-2 lin. latæ, nutantes, apice flosculis imbricatis basi alternatim remotiusculis instructæ: in-



feriores sæpe basi compositæ. *Squamæ* omnes albidæ, ferrugineo-tinctæ, obtusæ, muticæ, nervo viridi scabro infra apicem hyalinam ciliatam evanescente: vel fœmineæ inferiores rarius omnes lanceolatae, acutæ, vel cuspidatæ. *Perigynium*  $2\frac{6}{10}$ –3 lin. longum,  $\frac{6}{10}$ – $\frac{8}{10}$  lin. latum; ore semper albo-hyalino, facile rupto; laciniis plerumque obtusis, ciliatis; rostro ad margines sæpe scabro. *Achenium*  $1$ – $1\frac{1}{10}$  lin. longum,  $\frac{6}{10}$ – $\frac{7}{10}$  lin. latum, obovatum, longe stipitatum, triquetrum, castaneum, punctatum. *Stylus* flexuosus.

Var.  $\beta$ . *Perigynium*  $2\frac{8}{10}$  lin. longum,  $\frac{6}{10}$ – $\frac{7}{10}$  lin. latum. *Stylus* basi obliquus vel depressus.

Var.  $\gamma$ . *Perigynium*  $4$ – $4\frac{4}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, stipitatum. *Stylus* flexuosus.

I am not aware how far south the typical form extends. I have not seen any specimens of it south of Pennsylvania, except that of Buckley from the mountains of Carolina and Georgia; and though Elliott inserts the species in his 'Flora,' I do not quote him, as the specimen in his herbarium, under the name of *C. flexuosa*, was received from Muhlenberg, and no particular locality is given by Elliott for the species. Mr. Curtis informs me that the *C. digitalis* of Elliott's herbarium is also *C. debilis*, received from Dr. Torrey.

Between  $\alpha$  and  $\beta$  there are intermediate forms, which insensibly unite them. The specimens figured (Tab. CCLXXIII.) are from Mr. Sartwell. They approach *C. arctata*, but the scales and the sessile perigynium, with its acute base, at once distinguish them. The var.  $\gamma$  is in aspect different from many of the northern forms, and has a longer and narrower perigynium. It approaches *C. venusta*, especially the var.  $\gamma$  of that species, from which it differs in having a smooth perigynium. From the typical form of *C. venusta* it differs also in its longer rostrum, bilobed orifice, and more delicate nerves. It may, however, hereafter be judged to be rather a variety of *C. venusta* than of *C. debilis*. There are northern specimens differing from it only in having a shorter perigynium. Buckley's specimen differs only in this respect. In the typical form (Tab. CCLXXII.) the female spikes vary in length and breadth, more or less loosely flowered, erect-nutant, or the lower ones pendulous: the female scales vary in their length as compared with the perigynium, and in being more or less obtuse or acute. In the northern specimens, as compared with the var.  $\gamma$ , they are often acute or subacute, especially the lower ones, or lanceolate-acuminate, as long, or nearly as long, as the perigynium. The perigynium not only varies in length and breadth, but in the proportion between its body and rostrum. Two perigynia, of the same length, will thus differ in form; what in the one is added to the rostrum will be taken from the body of the perigynium, or the reverse. In some specimens the perigynium is narrower, closely applied to the achenium, assuming its triquetrous shape; or broader, tumid, and less triquetrous. The orifice is always hyaline, sometimes merely emarginate; at others, distinctly bilobed, the lobes ciliate and obtuse, especially on a lateral view of them. The lower sheaths are smooth, or more or less puberulent, the membranous portion closely beset with ferruginous spots. These spots are more distinct on the perigynia of the var.  $\gamma$  than on those of the more northern forms. It would be easy to select well-marked specimens of *C. debilis*, and make species of them; but I believe any one who will patiently study its variations will be convinced that all the forms are referable to one species, and I suspect a more enlarged acquaintance with the southern forms will show that they pass insensibly into those of the north, with which at present we are most familiar. We want to be better informed on the subject of *C. venusta*, and to understand more clearly its relation to *C. debilis*, or the degree of its own variableness.

229. *C. glabra* (Boott); spicis 4–5 oblongis vel cylindricis pedunculatis pallidis, terminali apice vel basi vel apice et basi rarius omnino mascula, reliquis fœmineis subdensifloris, superioribus approximatis inferioribus longe exserte pedunculatis nutantibus basi attenuatis laxifloris interdum compositis, infima remota; bracteis

vaginatibus culmum subæquantibus; stigmatibus 3; perigyniis triquetris turgidis lanceolato-ellipticis utrinque acutis vel rostellatis glabris, ore bidentato, (laciniis acutis) nervatis nervis prominentibus pellucide punctatis viridibus, squama ferruginea medio viridi nervata scabra ovato-lanceolata acuta vel mucronata rarius obtusa ciliata latioribus subduplo longioribus. (TAB. CCLXXV.)

HAB. In America septentrionali, New York, *Knieskern*.

*Culmus*  $1\frac{1}{2}$ – $2\frac{1}{2}$ -pedalis, apice setaceus, scaber; pars spicas gerens 4–9 poll. longa. *Folia*  $1\frac{1}{2}$  lin. lata, supra vaginæque inferiores scabriusculæ. *Bractæ* (nisi suprema) vaginatæ, culmum subæquantibus, vel infima nunc eo brevior. *Vagina* infima sub 2 poll. longa, scabriuscula. *Pedunculi* setacei, scabri, 2–3 poll. longi. *Spicæ* 8–21 lin. longæ, 2 lin. latæ. *Squamæ* ferrugineæ, medio viridi nervatæ, scabræ: masculæ lanceolatae, obtusæ, muticæ, apice ciliatæ: fœmineæ acutæ vel obtusæ, mucronatæ. *Perigynium*  $2\frac{7}{10}$ –3 lin. longum,  $\frac{8}{10}$ – $\frac{9}{10}$  lin. latum, bidentatum, laciniis acutis (nec membranaceis), nervis usque ad apicem conspicuis. *Achenium* 1 lin. longum,  $\frac{6}{10}$  lin. latum, ovali-triquetrum, stipitatum, basi styli apiculatum, flavidum.

A *C. oxylepide* differt culmo, foliis pedunculisque glabris (nec pilosis); perigyniis majoribus; squamis mucronatis; spicis inferioribus nutantibus, compositis.

A *C. formosa* differt spicis inferioribus, omnino fœmineis, etc.

A *C. debili* differt perigyniis rostellatis, ore acute bidentato nec hyalino, magis turgidis; nervis validioribus; squamis firmioribus.

I have received this species under the names of *C. formosa* and *C. debilis*. The absence of the subelongate rostrum and of the hyaline obtuse orifice separates it from *C. debilis* and its allies. It has hitherto escaped the notice of American botanists, and its value as a species must be determined by future observation. On showing it to Mr. Carey, he was of opinion that it belonged to his *Gracillimæ*, judging from the orifice of the perigynium. I have not been able to connect it with any known species of that group.

230. *C. retrorsa* (Schweinitz); spicis 5–8 cylindricis densifloris contiguibus olivaceis demum flavescentibus, terminalibus 1–4 masculis sessilibus gracilibus vel summa sæpe medio vel apice fœminea, aliisque basi fœmineis, reliquis fœmineis 4–5 crassis squarrosis oblique divergentibus, superioribus sessilibus evaginatibus, omnibus contiguibus vel infima plus minus vaginata exserte pedunculata distantibus sæpe basi composita; bracteis inferioribus latis longissimis, infima plus minus long laxèque vaginata; stigmatibus 3, brevibus; perigyniis ovatis vel ovalibus inflatis sensim in rostrum tenue acuminatis, ore bifurcato, horizontaliter patentibus vel recurvis glabris nervatis membranaceis; squama lanceolata obtusiuscula vel acuta mutica vel mucronata ferruginea apice albo-hyalina medio viridi nervata latioribus longioribus.—*C. retrorsa*, Schw. An. Tab.; Schw. et Tor. 366. t. 28 (bona); Dewey, ix. 67; Carey, 533; Sartwell, Exs. n. 150; Kunth, 503 (non Nees). *C. reversa*, Sprengel. (TAB. CCLXXVI.)

HAB. In America septentrionali. Canada to Pennsylvania. Wisconsin and North-west Coast (*Douglas*).

*Culmus* 2-pedalis, validus, triquetrus, superne scabriusculus, inferne foliatus; pars spicas gerens  $2\frac{1}{2}$ –12 poll. longa. *Folia* 2–4 lin. lata, culmo longiora, nodosa. *Bractæ* inferiores latæ, longissimæ: infima quandoque bipedalis, plus minus vaginata.



*Vagina* 3–12 lin. longa, laxa. *Pedunculus* infimus  $\frac{1}{2}$ – $2\frac{1}{2}$  poll. longus. *Spica mascula* suprema 1–3 poll. longa,  $1\frac{1}{2}$  lin. lata: aliae breviores, sessiles, contiguæ: omnes sæpe flosculis fœmineis basi vel medio vel apice instructæ: inferiores plerumque e perigynio, sæpe disrupto, egredientes. *Spica fœminea*  $1\frac{1}{2}$ –3 poll. longæ, 6–9 lin. latæ, plerumque arcte contiguæ vel infima  $1\frac{1}{2}$ –8 poll. remota: omnes evaginatae vel infima plus minus longe vaginata, exserte pedunculata: sæpe vel binæ inferiores basi ramulis 1–2 brevibus compositæ. *Squamæ* conformes, muticæ, lanceolatae, apice albo-hyalinæ: vel fœmineæ superiores mucronatæ. *Perigynium*  $3\frac{3}{10}$ – $4\frac{3}{10}$  lin. longum,  $1\frac{3}{10}$  lin. latum. *Achenium*  $1\frac{1}{10}$ – $\frac{3}{10}$  lin. longum,  $\frac{6}{10}$ – $\frac{7}{10}$  lin. latum, ovali-triuctrum, punctulatum, late stipitatum, basi styli crassiore contorto-apiculatum.

Variat foliis angustis, 1 lin. latis.—Canada, *Bourgeau*.

In the proliferous perigynia, from which some of the male spikes and the ramuli of the female ones issue, we occasionally find not only the exserted axis bearing florets, but the usual female floral organs, showing that the racheola, so often met with within the perigynium of other species, is a rudimentary axis. This fine species belongs to the *Vesicariæ*.

231. *C. tentaculata* (Muhl.) ; spicis 3–5 stramineis vel olivaceis approximatis, terminali mascula gracili subsessili cylindrica, fœmineis oblongis vel cylindricis crassis squarrosis obliquis vel divergentibus densifloris sessilibus evaginatiss vel inferioribus inserte vel exserte breve pedunculatis, infima sæpe subremota; bracteis foliaceis culmum longe superantibus; stigmatibus 3, brevibus; perigyniis ovalibus vel obovatis basi acutis sessilibus inflatis membranaceis in rostrum longum lineare attenuatis, ore obliquo emarginato vel bifido rarius integro, glabris vel ore rostroque scabris 8–10 nervatis, squama parva oblonga acuta vel truncata vel emarginata apice sæpe ciliata longe hispido-aristata alba medio viridi multum longioribus latioribusque.—*C. tentaculata*, Muhl. 239 (excl. *C. rostrata*, Mich.); Schw. et Tor. 335; Dewey, x. 34; Elliott, 543; Carey, 531; Sartwell, Eas. n. 137; Chapman, 543. *C. rostrata*, Willd. 282 (non Michaux); Schk. H. H. H. f. 134; Kunth, 496. (TAB. CCLXXVII.)

HAB. In America septentrionali et meridionali. Canada to Georgia and west to Arkansas (*Torrey*). Venezuela, Fendler, n. 1579 (*Herb. Gray and Hooker*). Andes of Quito. Ad ripam fl. Cosanga, 7000 ped., Jameson, 750 (*Herb. Hooker*).

Var.  $\beta$ . *gracilis*; spicis fœmineis 2 minoribus crectis; foliis angustioribus; culmo sæpe brevi.

HAB. Tennessee, *Lesquerieux*. Vermont, *Chapman*.

? Var.  $\gamma$ . *altior*; culmo bipedali; perigyniis  $5\frac{1}{2}$  lin. longis  $1\frac{7}{10}$  lin. latis basi ovatis stipitatis, nervis pluribus (16–18) quibusdam superne evanidis, ore altius bifido rostroque sæpius scabris; achenio abortivo.—*Sartwell* (var. *rostrata*), n. 138; Schk. G. G. G. f. 130? (TAB. CCLXXVIII.)

HAB. Penn-yan, *Sartwell*.

*Culmus* 12–15-pollicaris, triqueter, rigidus, lævis vel apice scabriusculus, inferne foliatus, basi vaginis foliorum purpureis reticulato-fissis tectus; pars spicas gerens 2– $5\frac{1}{2}$  poll. longa. *Folia* 2 lin. lata, culmo longiora, firma, carinata, nodosa, vaginis laxis. *Bractea* summa setacea, spicam masculam sæpe æquans: aliae 1–2 lin. latæ: infima sæpe subpedalis, vaginata. *Vagina* 2–6, rarius 12 lin. longa. *Pedunculus* infimus 2–8 rarius 16 lin. longus, gracilis, acutangulus, scaber. *Spica*

*mascula* 1– $2\frac{1}{2}$  poll. longa, quandoque abbreviata, 1– $1\frac{1}{2}$  lin. lata, basi laxiflora, sæpe bractea sterili paulo remota suffulta, brevi-pedunculata, pedunculus vix unquam spicam fœmineam supremam æquans. *Spica fœminea* 8 lin.– $2\frac{1}{2}$  poll. longæ, 6–10 lin. latæ, evaginatae vel infima interdum 1–2 poll. remota inserte vel exserte pedunculata: summa rarius basi mascula. *Squamæ* inferiores longius aristatae: fœmineæ parvæ, omnino inter perigynia celatae, arista nunc perigynium æquans: masculæ majores, lanceolatae, fulvæ. *Perigynium*  $3\frac{1}{2}$ –4 lin. longum,  $1\frac{3}{10}$  lin. latum, nervis distantibus. *Achenium* 1– $1\frac{2}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, ellipticum, triquetrum, papilloso-asperulum, stylo basi crassiore contorto.

The oblique emarginate orifice of the perigynium and the elliptic papillose achenium distinguish this species from *C. hystericina*. I have never seen specimens from the southern states. The one in Elliott's herbarium, Mr. Curtis tells me, was from Muhlenberg. Fendler however found it in Venezuela with the orifice of the perigynium entire. I have figured a perigynium from his specimen at the lower corner of Tab. CCLXXVII. I have observed the same oblique entire orifice in some of the specimens from Dr. Barratt from Connecticut.\* The var.  $\beta$  has the culm 4–15 inches in height, the female spikes 4–12 lines long, 3–4 lines broad. It was sent to me by Mr. Sullivant and Dr. Chapman. The other variety is possibly a hybrid between *C. tentaculata* and *C. lupulina*, for the achenia are abortive. It may be Schkuhr's *G. G. G.*, judging from the number of the nerves on the perigynium, and the absence of the achenium in the figure. It differs from *C. tentaculata* in the characters I have pointed out. It differs also from *C. Halei* and from *C. lupulina* in the squamæ; from the last also in the more divergent spikes and perigynia, narrower and shorter bracts, and narrower leaves. The absence of the achenium deprives us of the clear evidence it would afford as to the affinity. As the existence of hybrids in *Carex* is doubtless, this plant, as well as *C. Sullivantii*, is deserving of attention.

232. *C. Halei* (Carey); spicis 4 remotis pallide ferrugineis, terminali mascula cylindrica pedunculata, fœmineis orbiculatis vel oblongis crassis squarrosis remotis, inferioribus plus minus exserte pedunculatis; bracteis inferioribus vaginatis culmo paulo longioribus; stigmatibus 3, brevibus; perigyniis ovato-lanceolatis inflatis in rostrum longum tenue acuminatis, ore bifido, sessilibus glabris plurinerviis divergentibus, squama ovata acuta vel cuspidata medio late viridi nervosa margine hyalina latioribus plus duplo longioribus.—*C. Halei*, Carey, MSS.; Chapman's Fl. S. Un. St. 543. *C. turgescens*, Dewey, Sill. iii. 356 (1847) (excl. *C. folliculata*, Ell.) (non *Torrey*). (TAB. CCLXXIX.)

HAB. In America septentrionali. Florida (*Chapman*). Louisiana. Texas. Arkansas (*Carey*).

Var.  $\beta$ . *minor*; spica mascula 1–2-, fœmineis 5–7-flores; foliis angustis; culmo breviori graciliori.

Stolonifera. *Culmus* 1– $1\frac{1}{2}$ -pedalis, gracilis, triqueter, lævis, inferne foliatus; pars spicas gerens 4–10 poll. longa. *Folia* 1–3 lin. lata, culmo breviora. *Bractea*  $\frac{1}{2}$ –3 lin. latæ: inferiores (vel infima solum) vaginatae, culmo paulo longiores. *Vagina* infima 3–12 lin. longa. *Pedunculus* infimus 1–2 poll. longus, lævis. *Spica mascula* 1–2 poll. longa,  $1\frac{1}{2}$  lin. lata, basi bractea sterili subremota suffulta. *Squamæ masculæ* inferiores, longiores, lanceolatae, acutæ, plerumque nervo infra

\* In Jameson's specimens from the Andes of Quito, the orifice of the perigynium is oblique and bifid. The colour of some of the perigynia is purplish, and the lower spike in one specimen is compound at base, having two small abortive spiculæ.



apicem evanescente, margine hyalinæ. *Spicæ fæmineæ* 1-1½ poll. longæ, 12-15 lin. latæ: summa vel binæ superiores sessiles, evaginatæ, vel inferiores plus minus exserte pedunculatæ, à se 1-3½ poll. remotæ. *Perigynium* 6-6½ lin. longum, 2 lin. latum, divergens. *Achenium* 1-1½ lin. longum, 1-1½ lin. latum, ellipticum, triquetrum, utrinque acutum, angulis ad medium subnodosis, lucidum, olivaceum, stylo basi crassiore contorto.

Media inter *C. intumescens* et *C. lupulinam*.

A *C. intumescens* differt spicis fæmineis 3, oblongis, plurifloris; achenio angulis subnodosis.

A *C. lupulina*, cui maxime affinis, differt culmo gracili; foliis bracteisque brevioribus, angustioribus; spicis fæmineis minoribus, remotis, magis squarrosis; squamis acutis, nec longe aristatis.

I am indebted to Mr. Carey for Florida specimens of this plant, gathered by Dr. Chapman, who then referred it, with a query, to *C. turgescens*, Tor., under which name it was published by Dewey, in 1847. The habit of the smaller forms is more that of *C. intumescens*, but its real affinity is with *C. lupulina*, and future observation must determine whether it is separable from that species. A figure of the achenium of *C. lupulina* is given, to show its resemblance to that of *C. Halei*, more correct than in Tab. CLXII., where the subnodose prominence of the middle of the angles is too exaggerated.

233. *C. squarrosa* (L.); spicis 1-5 androgynis basi masculis cylindricis ovalibus vel rotundatis approximatis erectis pedunculatis densifloris crassis echinatis flavidis demum ferrugineis, terminali majore basi cuneata mascula, reliquis basi parce masculis, infima rarius remota brevissime vaginata; bracteis foliaceis, inferioribus culmum longe superantibus; stigmatibus 3, brevibus; perigyniis confertissimis obovatis vel turbinatis inflatis abrupte longe tenuiter rostratis, rostro lævi vel scabro, ore bidentato, horizontaliter patentibus vel inferioribus recurvatis parce nervatis membranaceis, squama lanceolata subobtusata vel acuminata acuta, nervo viridi margine pallida vel ferruginea latioribus longioribus.—*C. squarrosa*, *Lin. Sp. Pl.* 973 (1753); *Willd.* 215; *Schk. p.* 37; *Kunth*, 428; *Muhl.* 231; *Dewey*, vii. 270, et  $\beta$ . xi. 316; *Schw. et Tor.* 299. t. 27; *Drejer, Symb.* 29. t. 17; *Ell.* 526; *Darlington*, 354; *Carey*, 532; *Sartwell, Ews. n.* 148; *Chapman*, 537. *C. typhina*, *Mich.* 169. *C. typhinoides*, *Schw. An. tab. (fide Dewey)*. (TAB. CCLXXX., CCLXXXI.)

HAB. In America septentrionali. Canada to Georgia.

*Culmus* 1-2-pedalis, acute triquetus, rigidus, superne scabriusculus, foliatus, basi rudimentis foliorum purpureo-ferrugineis, vaginisque foliorum facile laceratis tectus; pars spicas gerens 1-6 poll. longa. *Folia* 2-3½ lin. lata, sæpe culmo longiora. *Bracteæ* foliaceæ, inferiores 2-3 lin. latæ, culmum longe superantes, subinde steriles, angustæ: infima quandoque brevissime vaginata. *Vagina* 1-2 lin. longa, pallide ferruginea. *Pedunculus* infimus ½-2 poll. longus, scaber. *Spicæ* ½-2 poll. longæ, 4-7 lin. latæ, obtusæ vel e flosculis superioribus abortivis acutæ: infima sæpe 2-2½ poll. remota: omnes basi cuneatæ, masculæ, vel inferiores parce vel vix masculæ. *Squamæ* conformes, sæpe apice ciliolatæ, masculæ superiores, e maturatione perigyniorum, sæpe recurvatæ. *Perigynium* (e compressione distortum) 3 lin. longum, 1-1½ lin. latum, demum (sub lente) punctis pallide ferrugineis maculatum. *Achenium* 1-1½ lin. longum, 1-1½ lin. latum, ellipticum, utrinque acutum, triquetrum, faciebus concavis, punctulatum, basi styli apiculatum.

A *C. stenolepis* differt spicis semper basi masculis, squamis lanceolatis, muticis.

Neither Willdenow nor Schkuhr, who merely copy the description of Linnæus, were acquainted with this beautiful species, originally found by Kalm in Canada. I have never seen specimens from so northern a locality. It was not brought from the British possessions by the arctic travellers, and in describing the Carices for Sir W. J. Hooker's 'Flora Boreali-Americana' this species was consequently omitted, from a forgetfulness of Kalm's habitat. Michaux found it in Illinois. It was known only in its monostachyous form till 1817, when Muhlenberg noticed a variety with two spikes. Elliott, who had his specimen from Muhlenberg, describes it with a simple spike. Torrey, in 1824, alludes to two and three in his monograph. Drejer has beautifully figured it in his 'Symbolæ' as monostachyous, but anticipated, from the existence of the sterile bracts, that five or six spikes might be found. Dr. Barrett, I believe, first verified this conjecture, by finding specimens with five spikes. I have never seen six. Torrey, who takes no notice of *C. typhinoides*, Schw., which Dewey gives as a synonym, gives the range of this species from Canada to Georgia, remarking that it is not found in the low parts of the States. Elliott, on the authority of Muhlenberg, says it is found on the mountains of Carolina and Georgia. Chapman says, in swamps near the mountains of Georgia. Elliott's specimen was from Muhlenberg, as I am informed by Mr. Curtis. I have not seen it from the southern States. It has been distributed in its finest development, by Dr. Barrett, from the highlands of New York and the banks of the Connecticut River; and by Dr. Short from the Ohio. He speaks of it as one of the most common of the western species. It differs in the size and number of its spikes and in the breadth of the leaves and bracts. In the figures here given, the perigynia are drawn as seen in their compressed state. Drejer places it, with *C. stenolepis*, in his *Spirostachyæ*, connecting that group with *Physocarpæ*.

234. *C. stenolepis* (Torrey); spicis 5-7 cylindricis stricte erectis comosis approximatis demum brunnescente-ferrugineis, terminali mascula vel basi mascula quandoque abbreviata vel obsoleta, reliquis fæmineis, ima basi parce masculis crassis obtusis densifloris squarrosis, superioribus contiguis sessilibus, inferioribus subremotis exserte pedunculatis; bracteis inferioribus vaginatis longissimis; stigmatibus 3; perigyniis obconicis inflatis abrupte rostratis, rostro pallido bifido, nervosis densissime compactis glabris membranaceis horizontaliter patentibus, squama lineari aristæformi hispida pallida multum latioribus brevioribus.—*C. stenolepis*, *Torrey, Mon.* 420 (*non Lessing*); *Dewey*, xxx. 59; *Carey*, 533; *Drejer, Symb.* 28. t. 16; *Sartwell, Ews. n.* 149; *Chapman*, 537. *C. Frankii*, *Kunth*, 498; *Kunze*, 39. t. 9. *C. Shortii*, *Steud. (non Torrey)*. *C. atherodes*, *Frank, Un. Itin.* (1835). (TAB. CCLXXXII.)

HAB. In America septentrionali. Pennsylvania to New Orleans and Texas. Ohio.

*Culmus* sub-2-pedalis, obtusangulus, firmus, stricte erectus, lævis, inter spicas genuflexus; pars spicas gerens 4-7 poll. longa. *Folia* 2-4 lin. lata, culmo longiora, nervosa. *Bracteæ* inferiores vaginatæ, latæ: infima quandoque bipedalis: summa setacea, spicæ masculæ sæpe longior. *Vagina* infima 1-1½ poll. longa. *Pedunculus* infimus 2-3 poll. longus, validus, lævis, e spathella oriens. *Spica mascula* ½-1½ poll. longa, 2 lin. lata, basi attenuata, laxiflora, subinde obsoleta. *Spicæ fæmineæ* ½-1½ poll. longæ, 4-5 lin. latæ, omnes alternatim contiguae, vel infima 2-4 poll. remota, flavescenti-virides, demum fusco-brunnescentes, rostro squamisque pallidis variegatæ: sæpe spicæ omnes (summa conspicue, aliæ inconspicue) basi masculæ. *Squamæ* omnes conformes, inferiores latiores. *Perigynium* (e compressione distortum) obovatum vel obconicum, 2½ lin. longum, sublineam latum. *Achenium* 1-1½ lin. longum,



$\frac{6}{10}$  latum, obconicum, obtuse trigonum, faciebus superne convexis, basi cuneatum, punctulatum, ferrugineum; basi styli abrupte apiculatum.

Var.  $\beta$ ; culmo brevi graciliore, axi minus flexuoso; foliis bracteisque angustis; spicis subrotundis vel ovalibus remotis; squamis latoribus, masculis muticis subinde emarginatis ferrugineis.

HAB. New Orleans, *Teinturier*. Alabama, *Drummond*.

The male florets at the extreme base of the female spikes have been overlooked by all authors. Drejer naturally allies this beautiful species to *C. squarrosa*, considering both to belong to his *Spirostachyæ*, and affording a transition into his *Physocarpæ*.

The var.  $\beta$  has a culm four inches long, and spikes three or four lines long and broad; the male spike especially with broad ferruginous squamæ, sometimes emarginate and without an arista.

235. *C. pilulifera* (L.); spicis 4–5 rarius 2–6 sessilibus congestis, terminali mascula sæpe abbreviata, foemineis (rarius apice masculis) subglobosis, infima interdum subremota vel radicali basi attenuata longe pedunculata; bractea infima evaginata culmum sæpe superante; stigmatibus 3, rarius 2; perigyniis subglobosis rostellatis bidentatis pubescentibus enerviis spongioso-stipitatis viridibus, squama ovata acuta vel lanceolata cuspidata purpurea, nervo viridi longioribus vel brevioribus.—*C. pilulifera*, *L. Sp.*; *Good. Lin. Trs.* ii. 190; *Wahl. Act.* 160; *Willd.* iv. 259; *Act. Berol.* t. 2; *Schk. f.* 39; *Gaudin, Agros.* 135; *Kunth*, 439; *Smith, Eng. Fl.* 112; *Eng. Bot. t.* 885; *Koch*, 876; *Anderson*, 30. t. 7. f. 82; *Reich. t.* 260; *Lang*, 111; *Bertol.* 82. *C. montana*, *L. C. filiformis*, *Fl. Dan. t.* 1048. *C. decumbens*, *Ehrh.* (TAB. CCLXXXIII.)

HAB. In Europa. Norway to the north of Italy.

*Radix* caespitosa. *Culmus* 4–15-pollicaris, triqueter, lævis, superne scabriusculus, sæpius incurvus, recumbens, nudus, basi foliatus, vaginisque foliorum ferrugineis tectus; pars spicas gerens 6–12 lin. longa. *Folia* 1–1½ lin. lata, culmo breviora, graminea, viridia. *Bractea* infima auriculata vel amplexans, spiculam subæquans, vel sesquipollicaris spicam superans: altera brevior, rarius conspicua. *Squamæ* conformes, plus minus purpureæ, margine albidæ, nervo viridi, late ovatæ, muticæ vel mucronatæ, vel lanceolatæ, acuminatæ, cuspidatæ: masculæ plerumque angustiores. *Spica mascula* 4–8 lin. longa, ½–1 lin. lata. *Spicæ foemineæ* 3–4 lin. longæ, 2 lin. latæ, omnes arcte contiguæ, vel infima 3–4 lin. (rarius 3 poll.) remota, brevi-pedunculata, vel subradicalis, basi attenuata, pedunculo bipollicari suffulta: superiores vel omnes rarius apice masculæ. *Perigynium*  $1\frac{1}{10}$ – $\frac{3}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, viride, rostello conico, brevi, purpureo: basi productum, spongiosum: membranaceum; nervis 2, marginalibus. *Achenium*  $\frac{3}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, globoso-triquetrum, fuscum, angulis pallidioribus; basi styli decidua, clavata, supra basin persistentem æqualem abrupte deflexam sita.

A *C. varia*, Muhl., differt spicis confertis, plurifloris, subinde apice masculis, e viridi-purpureo variegatis; perigyniis enerviis, rostello semper recto brevioribus bidentatis; basi styli persistente abrupte compresso-deflexa; culmo incurvo, basi vaginis foliorum pallide ferrugineis tecto; foliis viridibus.

Drejer (Rev. 55) says, "Quo modo *C. variam* a *C. pilulifera* distinguam, neque ex descriptione neque ex specimenibus eruere possum." Treviranus (Fl. Rossica, iv. 302) says, "*C. pilulifera* nimis affinis, nec separanda nisi notis, me saltem iudice, parum firmis est *C. marginata*, Muhl., cujus synonyma, sec. Torrey, sunt *C. Pennsylvanica*, Lam., et *C. varia*, Muhl., cujusque specimen,

auctoritatem Meyeri ferens, in Kamtschatka a Redowskio lectum inter plantas Ledebourianas vidi." Schlechtendal (Linnæa, x. 262) says, "*C. varia*, simillima *C. pilulifera*, et, uti nobis fere videtur, eadem." Kunth, p. 442, quotes Schlechtendal, without expressing any opinion of his own. Tuckerman, quoting Drejer, and referring to Schlechtendal's observation, quoted by Kunth, remarks of *C. varia* and *C. pilulifera*, "Species vigentes distinctæ mihi visæ sunt nostræque (*C. varia*) insignis, typus et caput gregis Americanæ propriæ."

I incline to Tuckerman's opinion. I have never seen any specimens from Kamtschatka. Those from Japan, collected by Wright in the United States Pacific Expedition, are referable to *C. Emmonsii*, judging from the elliptic triquetrous form of the perigynium, differing in the deep-purple colour of the squamæ and in the slight depression of the base of the style.

Goodenough (Lin. Trs. ii. 191) has alone noticed the occasional existence of male florets on the female spikes. He says, "In spicis foemineis flores terminales plerumque masculi. Post breve tempus hi decidui sunt, unde spicæ sæpius rotundæ evadunt." I have observed them only in a few specimens, as is the case with the inferior radical spicula, which is not noticed by any author, nor do I find any allusion to the depressed state of the style, which I find to be characteristic of *C. pilulifera*.

236. *C. Azorica* (Gay, Ann. Sc. Nat. p. 185: 1839).—Fl. Azorica, *Seubert*. (TAB. CCLXXXIV.)

HAB. In insulis Azoricis. Fayal and Pico, *Guthnick and Hochstetter*. Pico, *Dr. H. C. Watson*. St. Michael's, *T. C. Hunt, Esq.*

Habitus et inflorescentia *C. pilulifera*, L. Differt stigmatibus sæpius 2!; perigyniis ( $1\frac{1}{10}$  lin. longis,  $\frac{6}{10}$  lin. latis) compressis, brevius stipitatis, obovatis; spiculis 5–7, densius aggregatis, colore pallidioribus; squamis foemineis subrotundo-ovatis, obtusis, muticis, vel sensim vel abrupte apiculatis; achenio ( $\frac{6}{10}$ – $\frac{8}{10}$  lin. longo, ½ lin. lato) lenticulari, rarius plano-convexiusculo, sæpe racheola minima inserta vel exserta stipitato; basi styli persistente, recta vel depressa.

I am indebted to Dr. Watson for specimens of this plant, the aspect of which is that of *C. pilulifera*, L. I have never chanced to observe only two stigmas in *C. pilulifera*, but Gay remarks that, when they occur in it, the achenium is not compressed as in *C. Azorica*, but of an obtuse trigonous form. The racheola in *C. Azorica* is sometimes exserted, bearing a scale with a perigynium; at *f*, it is in the form of a squama only. The straight base of the style is especially visible in the lenticular achenium.

237. *C. Novæ-Angliæ* (Schweinitz); spicis 3–4 rarius 5 paucifloris e viridi purpureis, terminali mascula abbreviata sæpe inconspicua sessili, foemineis plerumque alternis vel contiguis, inferioribus sæpe bracteatis, infima remota breve (vel radicali longe) pedunculata; bracteis auriculatis læte viridibus, inferioribus vel omnibus culmo longioribus; stigmatibus 3; perigyniis obovatis vel ovalibus globosis vel obtuse subtrigonis basi longe stipitatis conico-rostratis, rostro sæpe subexcurvato, ore obliquo bifido, pubescentibus enerviis vel basi obscure nervatis, squama oblongo-ovata acuta plerumque mucronata purpurea, nervo viridi margine albo-hyalina latoribus longioribusque.—*C. Novæ-Angliæ*, *Schw. An. tab.*; *Schw. et Tor.* 328; *Dewey*, ix. 64; *Tor. Cyp.* 411; *Carey*, 525; *Kunth*, 408 (*excl. ejus descr., quæ C. Pennsylvanicam, Lam., pingit*). *C. pilulifera*,  $\beta$  deflexa, *Drejer*, Rev. 54. (TAB. CCLXXXV.)

HAB. In America septentrionali. Arctic America. Saddle Mountain, Massachusetts, alt. 3000 feet. Mount Marcy, New York. Greenland, *Vahl*.



*Radix repens.* Culmi 4–10 poll. longi, setacei, procumbentes, basi vaginis foliorum fusco-purpureis tecti; pars spicas gerens 3–12 lin. longa. Folia  $\frac{1}{4}$ –1 lin. lata, læte viridia, culmo breviora vel longiora. Bracteæ foliaceæ, sæpe omnes culmo longiores, infima interdum 2 poll. longæ. Spica mascula 2 lin. longa,  $\frac{1}{2}$  lin. lata, sessilis: fœminæ 2–3 lin. longæ, 2 lin. latæ, 3–8-floræ, sessiles, contiguæ, vel infima 3–8 lin. remota: rarius radicalis longe pedunculata. Squamæ omnes conformes. Perigynium  $1\frac{1}{2}$  lin. longum,  $\frac{7}{10}$  lin. latum, globosum, sæpe longe stipitatum; rostro nunc subexcurvato, basi subinde leviter nervatum. Achenium conforme,  $\frac{7}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, castaneum, angulis pallidioribus, breve stipitatum, apice umbone brevissimo disciformi-depresso superatum, basi styli persistente brevissima recta abrupte apiculatum. Stylus basi plus minus elavatus.

Arcte affinis *C. pilulifera*, L. Differt culmis setaceis; foliis angustioribus; spicis minoribus, alternis, infima plerumque subremota, inferioribus vel omnibus longe bracteatis; perigyniis sæpe paulo longioribus, angustioribus, rostro interdum longiore, subexcurvato, basi sæpe obscure nervatis; squamis angustioribus; basi styli persistente, brevissime recta.

I have seen very few specimens of this plant from the States, where it seems to be confined to the highlands. Sir John Richardson brought it from Arctic America, and the specimens figured are his. They certainly approach very near *C. pilulifera*, the difference being in the very abbreviate male spike, the generally alternate, smaller, less densely flowered female spikes, the often conspicuous bracts, the straight persistent base of the style, the occasional existence of nerves, the setaceous culm, and narrow leaves. The perigynium in its globular pyriform figure and shorter rostrum contrasts with the oval, triquetrous perigynium of *C. Emmonsii*, but there is a transition from *C. pilulifera* through *C. Novæ-Angliæ* to *C. Emmonsii*, and while Drejer unites the two first, Carey unites the two last.

238. *C. Emmonsii* (Dewey); spicis 2–4 rarius 5 plerumque contiguis sessilibus pallidis, terminali mascula abbreviata, fœmineis omnibus vel superioribus congestis, infima rarius 3–4 lin. remota vel sæpe radicali laxiflora longe pedunculata; bractea infima spiculam rarius culmum æquante; stigmatibus 3; perigyniis ovali-trigonis longiuscule cylindrico-rostratis stipitatis, ore albo hyalino obliquo bifido, pallide viridibus enerviis, squama oblongo-ovata obtusa mutica vel acuminata cuspidata albida, nervo viridi demum ad latera superne purpurascente margine albo-hyalina longioribus vel æquantibus.—*C. Emmonsii*, Dewey, in *Tor. Cyp.* p. 411; *Sartwell, Ews. n.* 105. *C. alpestris*, Dewey, vii. 268; *Schw. et Tor.* 341. *C. Davisii*, Dewey, x. 279 (non *Schw. et Tor.*). *C. Novæ-Angliæ*, var. Carey, 525. *C. lucorum*, var. Chapman, 539. (TAB. CCLXXXVI.)

HAB. In America septentrionali. Arctic America to New Orleans.

Cæspitosa. Culmi setacei, inæquales, reclinati vel decumbentes. Folia pallide viridia,  $\frac{1}{2}$ –1 lin. lata. Bractea infima plerumque solum conspicua, rarius culmum æquans vel superans. Spica mascula 2–4 lin. longa: fœminæ sessiles: infima rarius subremota vel radicalis. Squamæ conformes. Perigynium  $1\frac{3}{10}$ – $\frac{4}{10}$  lin. longum,  $\frac{4}{10}$ – $\frac{5}{10}$  lin. latum; rostro sæpe  $\frac{1}{2}$  lin. longum. Achenium  $\frac{6}{10}$ – $\frac{7}{10}$  lin. longum,  $\frac{4}{10}$ – $\frac{5}{10}$  lin. latum, ovale, truncatum, basi productum, trigonum, ferrugineum, angulis pallidioribus; basi styli clavata, articulata, decidua.

Var.  $\beta$ . *elliptica*; spicis congestis; perigyniis longioribus ( $1\frac{6}{10}$ – $\frac{8}{10}$  lin. longis,  $\frac{6}{10}$  lin. latis) hirsutis squa-

mam subduplo superantibus; achenio elliptico triquetro ( $1\frac{1}{10}$  lin. longo,  $\frac{1}{2}$  lin. lato), basi styli decidua. (TAB. CCLXXXVII.)

HAB. Arctic America, Richardson. Providence, Olmeyer. New York, Knieskern.

This plant in habit, in some respects, closely resembles *C. Novæ-Angliæ*, but differs in habitat, growing on hills and open mounds; in the pale colour of all its parts, its short bract, its congested female spikes, the more elongated and evidently trigonous form of the perigynium and achenium, and the deciduous base of the style. It never exhibits the dark green colour of the leaves and bracts or the purplish squamæ of *C. Novæ-Angliæ*; and in those specimens, where the lower culmeal spike is distinct, it is never more than four lines remote and always sessile. I have it from Arctic America, where *C. Novæ-Angliæ* is abundant, but most copiously from the States, from Rhode Island to New Orleans, where *C. Novæ-Angliæ* (except on high mountains) is unknown. I have drawn the characters from the general habit of the plant, some of which, as in all *Carices*, admit of variation, as is the case with the bracts, which very rarely are elongated. But the trigonous form of the perigynium and achenium, the long rostrum, and the distinct articulation of the style are constant.

The var.  $\beta$  has a longer body to the perigynium and a longer achenium, and the pubescence is softer and longer, and the proportionate length of the perigynium to the squamæ gives a peculiar aspect to the spike. It has not been noticed by authors.

In adhering to the names given to the several preceding species by authors, I have endeavoured to point out the characters in which they differ, leaving the question of specific distinction to future observers. I have been guided by habit, the form of the perigynia and achenia, and the base of the style (which has not attracted the attention of authors), to justify my adoption of established names.

239. *C. varia* (Muhlberg); spicis 3–5 pallidis remotis, terminali mascula abbreviata sessili vel cylindrica breve pedunculata pallide castanea, fœmineis sæpius 3, rarius apice masculis subtaxifloris, superioribus globosis paucifloris sessilibus, inferioribus oblongis subremotis pedunculatis; bracteis auriculatis, superioribus emarginatis spicis suis brevioribus, infima subinde foliacea culmo longiore vaginulata vel amplexante; stigmatibus 3; perigyniis obovatis vel globosis basi productis abrupte vel sensim rostratis, rostro nunc subexcurvo, margine scabro, ore bifido, pubescentibus enerviis vel basi plus minus nervatis pallidis; squama ovata acuta vel acuminata vel obtusa sæpe emarginata mutica vel cuspidata albida concolori vel pallide castanea longioribus vel subæquantibus.—*C. varia*,  $\beta$  pedicellata, Dewey, xi. 163; *Sartwell, Ews. n.* 109; *Kunth*, 442. *C. Pennsylvanica*,  $\beta$  Muhlenbergii, Gray, Carey, 526; *Torrey, N. Am. Cyp.* 410; *Chapman*, 539. *C. collecta*, Dewey, xi. 314. (TAB. CCLXXXVIII.)

Var.  $\beta$ . *minor*; culmo brevior; spicis minoribus paucifloris subrotundis sessilibus subcontiguis vel alternatim remotiusculis; squamis sæpe lucide castaneis; bractea infima sæpe abbreviata.—*C. varia*, Muhl. 236; Willd. 259; *Schk. f.* 167; *Wahl. Act.* 159; *Kunth*, 442; *Elliott*, 541; *Schw. et Tor.* 329; *Dewey*, xi. 162; *Sartwell, Ews. n.* 108. *C. Pennsylvanica*, *Torrey, N. Am. Cyp.* 410 (non *Lam.*). (TAB. CCLXXXIX.)

HAB. In America septentrionali. Canada to Georgia.

*Radix* cæspitosa. Culmi I– $1\frac{1}{2}$ -pedales, debiles, reclinati vel erecti, apice scabriusculi, basi vaginis foliorum purpureis tecti; pars spicas gerens  $1\frac{1}{4}$ – $2\frac{1}{2}$  poll. longa. Folia culmea angusta, I–3 poll. longa: sterilia I–2 lin. lata, firma, culmum



subæquantia, glauco-viridia. *Bractea* infima interdum foliacea, 1 lin. lata, culmo longior. *Spica mascula* 3–10 lin. longa. *Spica femineæ*, rarius apice masculæ, alternæ: superiores subglobosæ, paucifloræ, sessiles: inferiores oblongæ, pedunculatæ, 4–6 lin. longæ: infima sæpe 14 lin. remota, rarius basi composita. *Pedunculus* infimus 1–3 lin. longus. *Vagina* 1–1½ lin. longa. *Squamæ* pallidæ, vel castaneæ, margine albo-hyalinæ, obtusæ, muticæ vel acutæ, acuminatæ, cuspidatæ: fœmineæ interdum emarginatæ. *Perigynium* 1–1½–1¾ lin. longum, ¾ lin. latum, rostro ½–¾ lin. longo, sæpe basi plus minus nervatum. *Achenium* ¾ lin. longum, ¾ lin. latum, trigonoglobosum, faciebus convexis, basi breve productum, ferrugineum, angulis 3 pallidioribus, abrupte basi styli persistente recta æquali apiculatum. *Stylus* supra basin clavatus. *Stigmata* 3, longa.

A *C. pilulifera* differt inflorescentia laxa; spicis plus minus remotis, laxifloris, sæpe paucifloris; perigyniis subinde nervatis, rostro nunc excurvato, bifido; basi styli persistente recta; vaginis foliorum purpureis.

A *C. Pennsylvanica* differt spicis fœmineis sæpius pluribus; perigyniis sæpe nervatis; forma bractearum; foliis latoribus, glaucescentibus; radice fibrosa.

A *C. Novæ-Angliæ* differt colore pallido, bracteis superioribus brevioribus, et

A *C. Emmonsii* differt spica infima pedicellata; perigyniis globosis, ab utraque culmo validiore; foliis latoribus; spica mascula magis conspicua, fœmineis magis remotis; perigyniis subinde nervatis.

There is no abrupt transition from what I have considered should be the typical form of *C. varia* and its variety, for I observe them on the same root. The difference no doubt depends upon locality, the larger development found in moist woods and the smaller in open, dry hills, and then having a more coloured inflorescence. I can have no doubt of the specific distinction of *C. varia* and *C. Pennsylvanica*. In 58 specimens of *C. varia* I find—

2 with 2 spikes.

16 „ 3

35 „ 4

5 „ 5

—

58

and in 159 specimens of *C. Pennsylvanica* I find—

41 with 2 spikes.

94 „ 3

24 „ 4

—

159

In *C. Pennsylvanica* the terminal spike in 7 was female at top; in 4 the lower of 3 spikes was radical, oblong, lax-flowered on a long peduncle, and in 1 the lower of 4 spikes was 1 inch remote, with a leafy bract.

The resemblance of the var.  $\beta$ , with the elongated male spike, is however close. But the root of *C. Pennsylvanica* is stoloniferous, the leaves narrower, of a brighter green and softer texture, the female spikes oftener 2 or 1, and sessile; the perigynium oftener larger, variable in the length of the rostrum and laciniae, and nerveless; the bracts ovate-lanceolate, acute, more or less subfoliaceous, amplexiform at base, while those of *C. varia* are auricled, the upper emarginate, as the female scales occasionally are. The scales in *C. varia* are generally shorter than the perigynium, the rostrum sometimes oblique, the mouth less obliquely cut, and bifid, the lower spike often pedicellate. The perigynium in both when mature is suborbicular, spongy at base, as is common to the whole group. This spongy base contracts by age. There are only 2 prominent marginal nerves generally, though in *C. varia* there are occasionally nerves at base, more or less distinct, which appear translucent, when held to the light, after the achenium is removed. *C. varia* is a paler plant generally, and flowers later in the spring. I have never seen the lower spike radical in *C. varia*, nor the male spike androgynous, nor the vaginæ of the leaves reticulate.

240. *C. Pennsylvanica* (Lamarck); spicis 3–2 rarius 4, e viridi purpureis, terminali omnino vel basi mascula trigona sessili vel breve pedunculata, fœmineis sæpius 2 sessilibus paucifloris contiguis, vel infima subremota rarius radicali laxiflora longe pedunculata; bracteis squamæformibus acutis auriculatis amplexentibus cuspidatis spicula brevioribus, vel infima subulata rarius culmum æquante; stigmatibus 3; perigyniis globosis abrupte breve conico-rostratis, rostro recto, ore obliquo membranaceo integro vel bilobato sæpe alte fisso, pubescentibus enerviis viridi-ferrugineis, squamam oblongo-ovatum acutam vel acuminatam rarius cuspidatam purpuream margine anguste albo-hyalinam subæquantibus.—*C. Pennsylvanica*, *Lam. Ency.* iii. 388; *Torrey, Cyp.* 410; *Carey*, 526; *Darlington*, 350; *Sartwell, Eas. n.* 107; *Chapman*, 539. *C. marginata*, *Muhl.* 237; *Willd.* 261; *Schk. f.* 143; *Kunth*, 443; *Dewey*, xi. 163; *Schw. et Tor.* 332; *Elliott*, 542. (TAB. CCXC., CCXCI.)

HAB. In America septentrionali. Carlton House to Carolina and Georgia. Rocky Mountains.

*Radix* stolonifera. *Culmi* 6–12-pollicares, erecti, scabri, basi reliquiis foliorum fibratis vaginisque ferrugineo-purpureis reticulato-fissis foliisque brevibus teeti; pars spicas gerens 8–14 lin. longa. *Folia* ½–1 lin. lata, pallide viridia, graminea, culmo breviora vel æquantia. *Bracteæ* nunquam emarginatæ. *Spica mascula* 5–9 lin. longa, 1–1½ lin. lata (*sec. Muhl.*), trigona, rarius apice fœminea. *Spica femineæ* 2 vel 1, rarius 3, sessiles, 3–6-floræ, contiguæ, vel infima 6–10-flora, paulo remota, rarius radicalis, laxiflora, longe pedunculata. *Squamæ* purpureæ, nervo pallido, margine albo-hyalinæ: masculæ obtusæ vel lanceolatæ, acutæ vel cuspidatæ: fœmineæ perigynio plerumque longiores et latiores. *Perigynium* 1–1½ lin. longum, ¾ lin. latum. *Achenium* ¾–1 lin. longum, ¾ lin. latum, globosum, basi productum, angulis 3 notatis, vel teres, angulis oblitteratis, apice basi styli persistente æquali brevissima apiculatum. *Stylus* supra basin clavatus, sæpe demum exsertus.

Whether the *C. lucorum*, Willd. (Kunze, 153, t. 39), is to be considered a variety of *C. Pennsylvanica* (*rostrum elongato*), must be determined by future observation. The inflorescence and habit are the same. I have a specimen from Kunze from the mountains at Broad River, North Carolina, and can see no difference except in the elongated rostrum. I have figured a small specimen and perigynium in Tab. CCXCI. from Arctic America, in which the rostrum is unusually long, the specimen from which it was taken differing in no other respect from *C. Pennsylvanica*. Dr. Gray and Mr. Carey found a carex on the Roan and other mountains of North Carolina, which in habit is the same as *C. lucorum*, except that the leaves and culm are very long. Dr. Gray remarks that it “rarely fruits.” Mr. Carey (p. 525) says the plant figured by Kunze is *C. Novæ-Angliæ*, and he inserts “*C. lucorum*, Kunze, not Willd.?” as a synonym of that species, and adds:—“The mature perigynia in Kunze’s figure have the elongated beak of *C. nigro-marginata*, Schw. (possibly the *C. lucorum* of Willd.).” Mr. Carey takes no notice of the plant he found on the Roan Mountain, and probably the absence of perigynia prevented his observing its affinity to Kunze’s plant. Future observers must clear up the difficulty, my present impression being, with Schlechtendal (*Linnea*, x. 262) and Kunze, that *C. lucorum* is closely allied to *C. Pennsylvanica*.

Dr. Chapman, in his valuable ‘Flora of the Southern United States,’ inserts *C. lucorum*, and considers *C. nigro-marginata*, *C. Floridana*, and *C. Emmonsii* as varieties of it, all growing in “dry sandy soil, Florida to North Carolina.” He takes no notice of the plant found on the mountains of North Carolina.

241. *C. umbellata* (Schkuhr); spicis 2–6 ovalibus purpureis vel pallidis, terminali mascula rarius basi mascula



longe pedunculata vel sessili, fœmineis remotis subradicalibus inserte vel exserte pedunculatis æquialtis quasi umbellatis, vel superioribus 1-2 masculæ contiguæ; bracteis inferioribus foliaceis vaginantibus; stigmatibus 3, rarius 2; perigyniis globosis raro plano-convexis basi spongioso-stipitatis longe conico-rostratis, rostro recto vel subexcurvo, ore obliquo emarginato vel subbifido, plus minus pubescentibus enerviis vel nervatis marginibus scabris pallidis, squama ovata subacuta vel ovato-lanceolata cuspidata pallida margine purpureo-tincta demum sæpe decolori brevioribus vel longioribus.—*C. umbellata*, *Schk. f.* 171; *Willd.* 290; *Kunth*, 443; *Muhl.* 256; *Dewey, Sill.* x. 31, et xi. 316; *Schw. et Tor.* 352; *Tor. Cyp.* 427; *Carey*, 525; *Sartwell, Ews. n.* 104. (TAB. CCXCII., CCXCIII.)

HAB. In America septentrionali. Arctic America to Pennsylvania. Rocky Mountains.—Var. *β brevirostris* (Tab. CCXCIV.). Carlton House (*Richardson*).

Dense cæspitosa, stolonifera. *Culmi* plures, 1-4 poll. longi, basi vaginis ferrugineis scabriusculis reliquisque foliorum fibratis tecti. *Folia*  $\frac{1}{2}$ -1 lin. lata, culmos longe superantia, rigida, attenuata, apice callosa, truncata. *Bractea* suprema squamæformis, spicula brevior, vel setacea, culmum subæquans: inferiores vaginatæ, spicas superantes. *Spica* terminalis mascula, 4-6 lin. longa, 1 lin. lata, purpurea, subinde basi masculæ: reliquæ fœmineæ, 3-4 lin. longæ, 2-3 lin. latæ: omnes subradicales inter folia latentes, sæpe sessiles, vel superiores 1 rarius 2 masculæ contiguæ, inferior breve pedunculata. *Squamæ* ovatæ, muticæ, vel lanceolatæ, acuminato-cuspidatæ: masculæ sæpius fusco-purpureæ, margine albo-hyalinæ: fœmineæ ad latera purpureæ, nervo viridi: demum omnes decolores. *Perigynium*  $1\frac{8}{10}$ -2 lin. longum,  $\frac{8}{10}$  lin. latum: pube, nervis, oreque varians: rostro  $\frac{6}{10}$ - $\frac{7}{10}$  lin. longo; ore albo-hyalino, obliquo, integro vel emarginato vel subbifido: globosum, maturitate vix aut ne vix trigonum, rarius plano-convexum, enerve vel plus minus nervatum, pubescens vel fere glabrum, marginibus semper serrato-scabris. *Achenium*  $\frac{8}{10}$ - $\frac{9}{10}$  lin. longum,  $\frac{8}{10}$  lin. latum, globosum, faciebus convexis, vel rarius plano-convexum, pallidum, demum fusco-purpureum, obtusum, basi styli incrassata, articulata, decidua.

Var. *β brevirostris*; perigyniis minoribus  $1\frac{5}{10}$ - $\frac{6}{10}$  lin. longis,  $\frac{6}{10}$ - $\frac{7}{10}$  lin. latis, obovatis, triquetris, rostro  $\frac{2}{10}$  lin. longo, ore emarginato, squama late ovata obtusa vel acuta angustioribus brevioribus; achenio  $\frac{8}{10}$  lin. longo,  $\frac{1}{2}$  lin. lato, faciebus subplanis vel modice convexis. (TAB. CCXCIV.)

The var. *vicina* of Dewey, with the upper female near the male spike, is often found on the same root with the typical form, and Torrey remarks that it is a very constant character, except in the dwarf state of the plant.

It is constant in the var. *β*, which I have not seen from the States. The smaller and more triquetrous perigynium is like that of *C. Emmonsii*. The length of the rostrum is variable.

The specimens figured in Tab. CCXCII. are from Oriskany, New York; in Tab. CCXCIII. from the Methye Portage (the squamæ are more conspicuously cuspidate, and the perigynium smooth); and in Tab. CCXCIV. from Carlton House: the two last collected by Sir John Richardson.

The occasional occurrence of only 2 stigmata, with the accompanying modification in the form of the perigynium and achenium, had escaped my notice till after the figures had been engraved.

In Tab. CCXCIII., the figures at the bottom of the plate exhibit a terminal androgynous spicula, and a lateral one issuing from a spathella, and in the smaller figure a perigynium with its 3 stigmata, and an exserted rudimentary squama.

242. *C. Rossii* (Boott); spicis 4-5 pallidis paucifloris, terminali mascula, fœmineis flosculis 3-6 alternatim dispositis, superioribus 1-3 masculæ approximatis, inferioribus remotis inæqualiter longe exserte pedunculatis, infima radicali; bracteis superioribus (nisi summa) culmum superantibus, inferioribus vaginatis, omnibus (nisi infima) pedunculo brevioribus; stigmatibus 3; perigyniis ovalibus stipitatis longe rostratis bifidis pubescentibus enerviis, squamam ovato-lanceolatam acutam vel cuspidatam subæquantibus.—*C. Rossii*, *Boott, in Hook. Fl. Bor. Amer.* 222. (TAB. CCXCV.)

HAB. In America septentrionali. Rocky Mountains, *Drummond*; *Fendler, Pl. Nov. Mexicanæ*, n. 889.

*Culmi* 6-8-pollicares, gracillimi, acutanguli, scabri, basi rudimentis foliorum vaginisque nervatis scabriusculis purpureis tecti. *Folia*  $\frac{1}{4}$ -1 lin. lata, culmo longiora vel breviora, attenuata, apice callosa, truncata. *Bracteæ* foliaceæ, angustæ. *Spica mascula* 3-5 lin. longa. *Spicæ fœmineæ* 4-5; flosculis 3-5, rarius 6, attenuatim dispositis: superiores 1-3 masculæ approximatae: inferiores 2-3 remotæ, inæqualiter longe pedunculatæ, vaginatæ, vel infima radicalis, brevius pedunculata. *Pedunculi* 1-5 poll. longi: longiores reclinati vel decumbentes. *Squamæ masculæ* oblongæ, pallidæ vel purpureo-tinctæ, infima sæpe cuspidata: fœmineæ ovato-lanceolatæ, acuminatæ vel cuspidatæ, sæpe perigyniis longiores, plus minus pallidæ. *Perigynium*  $1\frac{8}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, ovale, inæqualiter turgidum, acute bifidum, marginibus scabrum. *Achenium*  $\frac{6}{10}$ -1 lin. longum,  $\frac{6}{10}$  lin. latum, subtrigono-globosum, obtusum, basi styli brevissime aut vix apiculatum.

A *C. umbellata* differt culmo capillari, altiori; pedunculis elongatis; spicis pauci-laxifloris; perigyniis bifidis.

I had never met with this plant since I first described it in the *Fl. Boreali-Americana*, many years ago, from Drummond's specimens, till Dr. Gray sent it to me from Fendler's collection. Whether it be anything more than a lax variety of *C. umbellata*, growing in deep woods, future observers must determine. I have never seen any specimens of *C. umbellata* from the States like it. The alternate arrangement and elongated peduncles of the female spikes, with 3-6 alternate flowers, and the acutely bifid mouth of the perigynium, with the long capillary culm, are the prominent distinctions.

243. *C. nigro-marginata* (Schweinitz); spicis 3 rarius 4-5 purpureis viridi-pictis paucifloris sessilibus, terminali mascula sæpe inconspicua, fœmineis masculæ contiguæ congestis, vel infima subremota rarius radicali exserte pedunculata; bracteis squamæformibus cuspidatis vel inferioribus subfoliaceis, infima culmum superante; stigmatibus 3; perigyniis ovalibus inæqualiter trigonis stipitatis rostratis, ore obliquo emarginato, marginibus scabris parce puberulis enerviis pallidis, squama ovata obtusa vel lanceolata acuta rarius cuspidata purpurea medio viridi angustioribus brevioribus vel subæquantibus.—*C. nigro-marginata*, *Schw. An. tab.*; *Torrey, Cyp.* 412; *Dewey*, x. 232; *Kunth*, 481. *C. lucorum*, *Sartwell, Ews. n.* 106. *C. lucorum*, var., *Chapman, Fl.* 539. (TAB. CCXCVI.)

HAB. In America septentrionali. Carolina, *Schweinitz*, *Mr. Curtis*.

Cæspitosa. *Culmi* 1-10-pollicares, gracillimi, superne scabri, reliquiis foliorum fibratis vaginisque scabriusculis reticulato-fissis ferrugineis tecti. *Folia* annotina  $\frac{1}{2}$ - $1\frac{1}{2}$  lin. longa, culmo multum longiora, superne curvata, firma. *Bracteæ* squamæ-



formes, vel inferiores 1-2 subulato-foliaceæ. *Spicæ* concolores: maseula 3 lin. longa, sessilis: fœmineæ 2-3 lin. longæ: omnes congestæ, vel infima paulo remota, rarius radicalis, plus minus longe exserte pedunculata. *Squamæ* conformes. *Perigynium*  $1\frac{5}{10}$ - $\frac{8}{10}$  lin. longum,  $\frac{5}{10}$ - $\frac{6}{10}$  lin. latum, compresso-subtrigonum: angulo ut in affinibus introrso; rostro  $\frac{4}{10}$  lin. longo; ore emarginato bidentato; marginibus interdum lævibus: parce puberulum. *Achenium*  $\frac{8}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum, plano inæqualiter trigonum, castaneum; basi styli clavata, articolata, decidua.

This species is allied to *C. Emmonsii*, chiefly differing in the deep purple colour of the squamæ, and the remarkably long, curved, rigid leaves. Dewey, I know not on what authority, quotes Schweinitz for its being found in Pennsylvania. In the analytical table it is said to be a native of Carolina, and Torrey gives "Salem, North Carolina," as the habitat, on the authority of Schweinitz. Mr. Curtis found it on Society Hill, South Carolina, and though not noticed by Elliott, Mr. Curtis tells me it is in his herbarium from Schweinitz from North Carolina. I have not observed any florets with 2 stigmas. Dewey, in his character, gives 3, and in his description says they are 2. From its close affinity with *C. Floridana*, which has commonly 2, but occasionally 3 stigmas, it is more than probable that 2 will be found in *C. nigro-marginata*, especially as the perigynium occasionally exhibits a lenticular or plano-convex form.

244. *C. Floridana* (Schweinitz, An. tab.).—*Schw. et Tor.* 306. t. 28. fig. 1; *Dewey*, x. 45; *Kunth*, 408; *Torrey*, *Cyp.* 411. *C. lucorum*, var., *Chapman*, *Fl.* 539. (TAB. CCXCVII.)

HAB. In America septentrionali. Florida, *Chapman*, *Le Conte*.

Habitus et inflorescentia *C. nigro-marginatæ*, sed pallidior; spicis pene decoloribus, leviter tantum purpureo-tinctis; stigmatibus 2, rarius 3; perigyniis ovalibus, plano-convexis, rarius trigonis; achenio lenticulari vel triquetro.

This plant looks like an etiolated *C. nigro-marginata*. Dr. Chapman, in his notes, contends for its specific distinction on the ground that it has invariably 2 stigmas, with the corresponding plano-convex and lenticular form of the perigynium and achenium. But I have specimens of his in which 3 stigmas are discernible, and M. Spach thinks such are generally to be found on the top of the spikes. Torrey, in his Mon. 412, remarks that "it has 3 stigmas almost uniformly" in his specimens. Both he and Schweinitz had previously described only 2; and from the congested spikes and inconspicuous male spike, Schweinitz was, in his analytical index, misled, describing "the androgynous spike male in summit," an error which in his and Torrey's monograph led to the idea that it was allied to *C. Muhlenbergii*. Dewey first corrected this error, rightly associating it with *C. Nova-Angliæ*. He describes the stigmas as 2 only, and I cannot but suspect that Torrey, in his monograph, referred to other specimens sent by Chapman, which have 3 stigmas and a trigonous perigynium, and which Chapman referred with a query to "*C. Emmonsii*?" I am indebted to Mr. Carey for specimens of them. They are too young, but I think do not essentially differ from *C. Emmonsii*. They are stouter and have long foliaceous stolons, and are without the long annottinous leaves of *C. Floridana*.

Dr. Chapman, in his Flora, p. 539, has since adopted other views, and considers *C. Floridana* a variety of *C. lucorum*. He certainly errs in saying the stigmas are 3. In all the specimens I have seen they are generally 2. This zealous botanist, to whom we are so recently and largely indebted for his very valuable 'Flora of the Southern United States,' will in the future editions of his work, I hope, clear up the difficulties of this group, contrasting the plant from the mountains of North Carolina with those from the sandy plains, and the Southern forms with those of the Northern States. My object in these 'Illustrations' has been to give figures of what have been generally considered species, leaving

future observers in the fields of nature to determine their specific claims, but fully alive to the importance of carefully noting all evident variations from a typical character.

245. *C. Richardsoni* (Brown); spicis 2-4 oblongo-cylindricis subremotis erectis albido-purpureis, terminali mascula pedunculata, fœmineis inserte vel breve exserte pedunculatis; bracteis vaginæformibus aphyllis; stigmatibus 3, longis; perigyniis obovatis inæqualiter trigonis abrupte rostellatis, ore hyalino integro, pubescentibus enerviis membranaceis pallidis, squama ovato-lanceolata acuta vel obtusa purpurea margine late scariosa amplexante angustioribus brevioribusque.—*C. Richardsoni*, *Brown*, *Franklin's Nar. App.* 763 (1823); *Hooker*, *Fl. Bor. Am. t.* 223; *Kunth*, 519; *Schw. et Tor.* 330; *Dewey*, xi. 152; *Carey*, 526; *Sartwell*, *Ews. n.* 110. (TAB. CCXCVIII.)

HAB. In America septentrionali. Arctic America, *Richardson*. Rocky Mountains, *Drummond*. North-west Coast, *Douglas*. Illinois, *Mead*. (New York, *Dewey*.) Wisconsin, *Sartwell* (*vide Carey*).

Stolonifera. *Culmus*  $\frac{1}{2}$ -1-pedalis, seaber, obtusangulus, erectus, basi vaginis foliiferis ferrugineis tectus; pars spicæ gerens  $1\frac{1}{2}$ -3 poll. longa. *Folia*  $\frac{1}{2}$ -1 lin. lata, plana, firma, culmo breviora. *Vaginæ* bractearum purpureæ, apice seariosæ, aetæ, aphyllæ, 1-4 lin. longæ. *Pedunculus* infimus 4-8 lin. longus, seaber. *Spica* maseula 4-12 lin. longa, 1-2 lin. lata, sæpe clavata. *Spicæ fœmineæ* plerumque breviores, æquilatæ, subdensifloræ, infima interdum basi ecomposita. *Squamæ* conformes, demum deeolores. *Perigynium*  $1\frac{3}{10}$  lin. longum,  $\frac{6}{10}$  lin. latum. *Achenium* 1 lin. longum,  $\frac{6}{10}$  lin. latum, conforme, inæqualiter subplano-trigonum; ferrugineum basi styli inerasata.

This example of the *Dactylostachyæ* of Drejer in habit is like *C. cardiolepis*, Nees, but differs in the nerveless perigynium and squamæ. It was considered to be confined to the northern parts of the American continent till Dr. Mead discovered it in Illinois. I have not seen specimens from any other parts of the States. I observe occasionally, in some young florets, 4 stigmas, and the composition of the female spike is from proliferous perigynia, bearing on each side of the spike an exserted axis, with one or two perfect flowers. The marginal bracts terminate in an acute scarious apex.

246. *C. Tolmiei* (Boott); spicis 3-9 atro-vel ferrugineo-purpureis ovatis oblongisque, terminali mascula subsessili, fœmineis sæpe apice masculis, superioribus ovatis sessilibus arcte contiguis, inferioribus oblongis remotis longe setaceo-pedunculatis nutantibus vel pendulis evaginatis; bracteis inferioribus foliaceis, infima culmum subæquante; stigmatibus 3; perigyniis ovalibus compresso-subtriquetris cylindrico-rostellatis, ore integro obliquo, pallidis purpureo-tinctis parce nervatis, squama ovata obtusa mutica purpurea, nervo pallido margine sæpe decolori brevioribus vel longioribus.—*C. Tolmiei*, *Boott*, *Hook. Fl. Bor. Am.* 224. *C. melastoma*, *Fischer*, in *Herb. Boott*. (TAB. CCXCIX.)

HAB. North-west Coast, America. Columbia River, *Tolmie*; *Seemann*, n. 2207 (*Herb. Hooker*). Behring's Straits, *Langsdorff* (*Fischer*). Arakamtchetchene Island, Behring's Straits, *Wright*, in *U. S. N. Pacific Exp.* (*Herb. Gray*).

*Rhizoma* horizontaliter repens, fibris lanatis. *Culmus* 1-1½-



pedalis, triqueter, validus, lævis, basi foliatus, foliisque marcidis, reliquisque pallidis laceratis rudimentisque foliorum ferrugineis tectus; pars spicas gerens 3–5 poll. longa. *Folia* 1–2 lin. lata, firma, carinata, culmo breviora, apice triquetra, scabra. *Bractea* 2–3, foliaceæ, evaginata: infima culmum subæquans: auriculæ oblongæ, ferrugineæ. *Pedunculus* infimus 1–1½ poll. longus, setaceus, subinde contortus. *Spica mascula* 6–8 lin. longa, sub lineam lata, sessilis vel breve pedunculata. *Spice fæmineæ* 4–8, quandoque apice parce masculæ, 3–8 lin. longæ, 2 lin. latæ: superiores breviores, ovatae, sessiles, arcte contiguæ: inferiores oblongæ, deorsum magis remotæ longeque pedunculatæ: infima 1–2½ poll. remota, basi laxiflora, nutans vel pendula. *Squamæ* masculæ ferrugineo-purpureæ, vel omnes atro-purpureæ, nervo pallidiore, muticæ: fæmineæ inferiores longiores. *Perigynium* 1–1½ lin. longum, ½–¾ lin. latum, utrinque leviter nervatum, (sub lente) tenuissime granulatum. *Achenium* 7/10–8/10 lin. longum, 4/10–5/10 lin. latum, inæqualiter triquetrum, pallide ferrugineum, angulis pallidioribus, tenuissime punctulatum, basi styli æquali abrupte apiculatum.

This species has much of the aspect, and in some respects the habit of *C. rigida*, Good., from which it differs in the number of its spikes, its 3 stigmas, triquetrous achenium, and nerved perigynium. The existence of 3 stigmas in *C. rigida* is very rare. In one of the florets from a specimen of Wright, I found a filiform racheola longer than the achenium. It belongs to the *Micro-rhynchæ* of Drejer.

247. *C. miliacea* (Muhlenberg); spicis 4 rarius 3–5 gracilibus cylindricis flavescenti-viridibus demum pallide ferrugineis basi attenuatis, terminali mascula vel apice rarius medio fæminea pedunculata nutante, fæmineis approximatis nutantibus vel pendulis, supremo sæpe sessili inferioribus basi verticillatim vel alternatim dissitifloris setaceo-pedunculatis, infima subremota obsolete vel breve vaginata; bractea infima foliacea, plerumque culmo longiore; stigmatibus 3; perigyniis oblongo-ovatis acuminatis tenuiter rostellatis, ore membranaceo integro vel emarginato, enerviis rarius parce nervatis superne vacuis subcontortis vel excurvis inferne trigonis flavescenti-viridibus tenuissimis glabris squama ovata vel lanceolata acuminata vel obtusa truncata rarius emarginata cuspidata albida, nervo viridi longioribus latioribusque.—*C. miliacea*, *Muhl.* 257; *Willd.* 290; *Schk.* 77. *O. O. O.*; *Ell.* 552; *Dewey*, x. 30; *Schw. et Tor.* 353; *Darlington*, 39; *Kunth*, 469; *Carey*, 526; *Sartwell*, *Ews. n.* 114; *Chapman*, 538. *C. prasina*, *Wahl. Act.* 161. (TAB. CCC.)

HAB. In America septentrionali. Canada to the mountains of Georgia.

*Culmus* 1½–2-pedalis, gracilis, debilis, superne scaber, basi foliatus, apice nudus; pars spicas gerens 2½–7 poll. longa. *Folia* 1½–2 lin. lata, culmo breviora, plana, graminea. *Bractea* infima plerumque culmo longior, obsolete vel breve vaginata: superiores setaceæ. *Vagina* 1–6 lin. longa, ligula membranacea oblonga amplexans, pallida. *Pedunculus* infimus ½–1½ poll. longus, setaceus, scaber. *Spica* terminalis mascula vel apice rarius medio fæminea, basi attenuata, laxiflora, 1–2 poll. longa, 1 lin. lata, nutans. *Spice fæmineæ* sæpius 3, infima 1–3½ poll. remota, inferiores flosculis basi verticillatim vel alternatim laxe dispositis, nutantes vel pendulæ. *Squamæ* omnes albidæ, demum pallide ferrugineæ, margine hyalinæ, nervo viridi vel ferrugineo: masculæ lanceolatae, acutæ, muticæ vel mucronulatae: fæmineæ ovatae vel lanceolatae, acuminatae: vel obtusæ, truncatae, rarius emarginatae, cuspidatae. *Perigynium* 1–1½–7/10

lin. longum, 6/10 lin. latum, basi antice angulo achenii distentum, superne vacuum; rostello tenui, albido. *Achenium* 8/10 lin. longum, 6/10 lin. latum, circumscriptione subrotundo-obovatum, triquetrum: angulis medio incrassatis, lateribus insigniter concavis: pallide castaneum; basi styli demum decidua.

No author has confidently decided on the affinity of this species. Tuckerman places it among his *Acutæ*. Carey thought it was not allied to any of the American species he had described, and for convenience placed it in his *Anomalæ*, with *C. scabrata* and *C. Sullivantii*. Both he and Dewey thought that in aspect it was like some forms of *C. crinita*. The perigynium has a general resemblance to that of *C. torta*, but the peculiar achenium, and the yellowish-green colour of its spikes, and the white scales with their green nerve and mucro, separate it from the *Melanostachyæ* of Drejer, which include the *Acutæ*. Its inflorescence is like that of *C. gracillima* and its allies. The achenium, with its concave sides and angles incrassate at the middle, is like that of *C. glaucescens* and *C. scabrata*, and I am inclined to place it with the last.

The emargination of the scales is by no means constant. Dewey remarks that it is so slight as to require nice examination. Torrey describes them as acuminate, and Carey as ovate. I have not seen any specimens south of Virginia. Elliott has none in his Herbarium, and he quotes Pursh for its locality. Chapman finds it in the mountains of Georgia.

248. *C. Wahlenbergiana* (Boott); spica elongata ferruginea rarius pallida concolori, e spicis partialibus singulis sub 8 (ambitu lanceolato) compactis, inferioribus remotis exserte pedunculatis subduplicato pinnatim compositis, basi ramosis, ramis appressis, usque ad basin spiculiferis; spiculis lanceolatis erectis congestis apice plus minus masculis; bracteis superioribus culmo longioribus; stigmatibus 3; perigyniis lanceolatis plano-triquetris rostratis bifidis glabris marginibus serratis nervatis rectis, squama late ovata acuta vel obtusa subemarginata striato-nervosa glabra aristata ferruginea margine albo-hyalina nervo viridi angustioribus longioribusque.—*C. Wahlenbergiana*, *Boott.* *C. Indica*, *Wahl. Act.* 149 (*excl. Lin.*); *Willd.* 246 (*excl. Lin. Mant.*); *Schk. f.* 206 (*excl. Lin.*); *Poiret*, *Ency. Suppl.* iii. 240 (1813); *Kunth* (*ejus descr. excl. Lin., Nees*). (*Non Lin. Mant.; nec Lamarck, Ency. iii.* 385 (1783), *nec Nees*.) *C. Persoonii*, *Schk.* (TAB. CCCI.)

HAB. In insulis Bourbon et Mauritius, et in Abyssinia.

Var.  $\beta$ ; perigyniis squamisque scabris. (TAB. CCCII.)

Var.  $\gamma$ ; perigyniis omnino vel superne tantum scabris, rostro breviori. (TAB. CCCIII.)

Var.  $\delta$ . *Schimperi*; culmo altiori; foliis glaucis; bracteis superioribus culmo brevioribus demum obsoletis; perigyniis 3 5/10–7/10 lin. longis, 8/10 lin. latis, squamis subinde muticis, spathella vix gibbosa. (TAB. CCCIV.)

HAB. In Abyssinia, ad montem Silhe, alt. 9–10,000 ped., *Schimper*, n. 545 (1852), *Herb. Mus. Paris*.

Var.  $\epsilon$ ; brevifolia. (TAB. CCCV.)

*Culmus* 2-pedalis, lævis. *Folia* 2–4 lin. lata, culmum subæquantia. *Bractea* inferiores vaginatae, culmum æquantes; superiores angustæ, eo longiores. *Vagina* infima 1½–2½ poll. longa. *Pedunculi* 1–3 poll. longi, scabriusculi. *Spice* partiales 1–3½ poll. longæ, 6–8 lin. latæ: inferiores ramis erectis coarctato-aggregatis. *Spiculæ* 5–9 lin. longæ, 2 lin. latæ, erectæ, appressæ, rarius patentiores, contiguæ. *Perigynium* 2 4/10 lin. longum, fere 6/10 lin. latum, bifidum, plerumque rectum; laciniis 2/10 lin. longis, acutis vel obtusiusculis, carinato-com-



plicatis, margine membranaceis; carina ciliato-scabra, rarius sublævigata; rostro plus minus longo. *Achenium* stipitatum,  $1-1\frac{2}{10}$  lin. longum,  $\frac{1}{2}$  lin. latum, plano-triquetrum, pallidum, basi styli æquali apiculatum. *Stylus* puberulus. *Spathella* gibbosa.

A *C. ramosa*, Schk., differt inflorescentia magis compacta, simpliori; spicis singulis aggregatis; ramis ad basin spiculis, erectis; perigyniis glabris, latoribus, bifidis, laciniis subulatis, margine membranaceis, brevioribus.

I have no hesitation in referring the *C. Indica* of the authors quoted to this species. The "spicis compositis, ramis aggregatis, capsulis depresso-triquetris" of Wahlenberg, exactly apply to it, and not to the *C. Indica* of Linnæus, to which he, Willdenow, and Schkuhr referred it. They all refer it to the island of Bourbon. Kunth gives the description of Nees, but adds one of his own from a specimen from the Mauritius, which he says is similar to the Bourbon one in Herb. Willdenow. Lamarec copies the description of Linnæus, translating into French Linnæus's observations, and afterwards alludes to a specimen he has of Commerson from Bourbon, which he says offers some particulars not expressed by Linnæus. Poiret, in the Supplement to the French Encyclopædia under *C. Indica*, quotes all the above references to Willdenow, Wahlenberg, and Schkuhr.

I have had an opportunity, through the kindness of M. Spach, of examining the specimens in the Paris collection, gathered in the isle of Bourbon by Commerson, Richard, and Boivin, and one from the Mauritius in Herb. Hooker. They differ in the pale or ferruginous colour of the inflorescence, in the smoothness or roughness of the perigynium, which is from  $\frac{6}{10}$  to  $\frac{8}{10}$  of a line in breadth, in the length of the rostrum, the laciniæ acute or obtuse, often unequal and more or less ciliate, and in the squamæ being more or less obtuse or emarginate. The species is well characterized by the compact spikes, the branches being erect, the spiculæ appressed, rarely patent, and the perigynia but slightly excurved.

The specimens figured are,—

Tab. CCCI. From the Isle of Bourbon, gathered by Boivin, the same as the plant from the Mauritius in Herb. Hooker.

Tab. CCCII.  $\beta$ . With rough perigynia and squamæ, from Bourbon, Richard.

Tab. CCCIII.  $\gamma$ . From Bourbon (Commerson), the perigynia broader, more or less scabrous, the rostrum short, the style very rough, and the achenium occasionally with a linear racheola.

Tab. CCCIV. From Abyssinia, Schimper (Herb. Mus. Paris).

There are no essential characters in the Abyssinian plant to justify its separation from the insular one. The perigynium is longer, and the upper bracts shorter, and the squamæ occasionally muticæ.

Tab. CCCV. Isle of Bourbon, Boivin, a solitary specimen in Herb. Mus. Paris, with short leaves, otherwise in squamæ approaching *C. crinigera*, B.

249. *C. crinigera* (Boott); spica longissima ferruginea concolori supradecomposita, e spicis partialibus sub 12 (ambitu latè ovato) laxis patulis, extremis singulis, reliquis geminis inæqualibus, superioribus sessilibus evaginatis pinnatim, inferioribus subæqualiter distantibus longe graciliter exserte pedunculatis duplicato vel deorsum ramosis subtriplicato pinnatim compositis; ramis basi nudis; spiculis lanceolatis alternis divaricatis plus minus apice masculis; stigmatibus 3, longis; perigyniis fusiformibus triquetris longe rostratis alte bicuspidatis (laciniis filiformibus) undique scaberrimis tenuiter nervatis obliquis vel subexcurvis, squama lanceolata acuta aristata striato-nervosa scaberrima ferruginea sæpe concolori angustioribus longioribusque. (Tab. CCCVI.—CCCVIII.)

Var.  $\beta$ ; minor. (Tab. CCCIX.)

HAB. In the Island of Bourbon (Herb. Mus. Paris).

*Culmus* 3-pedalis, validus, lævis, superne scaber; pars spicas gerens 2-2½-pedalis. *Folia* 3-4 lin. lata, culmum subæquantia,

rigida. *Bracteæ* inferiores 3-4 lin. latæ, longæ, vaginatæ; superiores angustæ, culmo breviores. *Vaginæ* inferiores 2-3 poll. longæ. *Pedunculi* inferiores 3-5 poll. longi, graciles, scabri. *Spicæ* partiales superiores subpollicem longæ, singulæ, sessiles, contiguæ: reliquæ geminatæ, 2-3½ poll. longæ,  $1\frac{1}{2}$ - $2\frac{1}{2}$  poll. latæ, inæquales, deorsum basi magis ramosæ; ramis apertis, basi nudis; rachii scabra, sæpe flexuosa. *Rami*, ut spiculæ, e spathella egredientes, bracteolis minimis setaceis suffulti. *Spiculæ* 4-8 lin. longæ, divaricatæ. *Squamæ* conformes, scaberrimæ. *Perigynium* 2½ lin. longum,  $\frac{1}{2}$  lin. latum, nervis marginalibus magis prominentibus, alte bicuspidatum, laciniis filiformibus  $\frac{1}{2}$  lin. longis undique scaberrimum. *Achenium* (cum stipite  $\frac{1}{10}$  lin. longo)  $1\frac{2}{10}$  lin. longum, plus quam  $\frac{4}{10}$  lin. latum, triquetrum, fuscum, basi styli æquali apiculatum. *Stylus* puberulus.

*C. ramosa* seems to have been established by Schkuhr, on specimens from the Mauritius, as Willdenow quotes his figure, which however was not published till 1806, when he corrected Willdenow's error as to the number of stigmata. Kunth, under *C. ramosa*, quotes *C. cruciata*, Wahl., as a synonym, on the authority of Wahlenberg in his Fl. Lapponica, p. 250, and consequently gives all the habitats of Schkuhr, Wahlenberg, Willdenow, and Nees, thus making it a native of the Mauritius, China, and the East Indies. He describes it from specimens sent to him from Paris, which he says are like those of Willdenow, but does not say of which country they were native.

Nees has no *C. ramosa* in his list in Wight's 'Contributions,' but he speaks of it under *C. meiogyna*. I infer, therefore, he considered it distinct from *C. cruciata*, Wahl. Had he thought them the same, he would have quoted *C. ramosa* as a synonym to *C. cruciata*, and have contrasted his *C. meiogyna* with *C. cruciata*, which he describes, and not with *C. ramosa*. I am informed by M. Spach that there is no authentic specimen of *C. ramosa*, so named, in the Paris Herbarium, but it was probably established on specimens collected by Commerson or Petit-Thouars, as such are in the herbarium of the garden of plants found by them in the Mauritius. There is also a specimen from the same island in Herb. Hooker, from Bojer.

I have, through the kindness of M. Spach, had the opportunity of examining a suite of specimens of *C. crinigera* from the Paris collection, gathered in the island of Bourbon by Richard, Boivin, Bernier, and Gaudichaud, which differ from *C. ramosa* in geminate spikes, larger spiculæ, and a deeply bifid and highly excurved perigynium, scabrous squamæ, and a more complex inflorescence. The fig. n. 204, of Schkuhr, is the only authority I have for his *C. ramosa*, which is a native of the Mauritius. I am not aware of the date of Commerson's or Petit-Thouars's visit to that island, but I think it probable the specimens of *C. crinigera* sent to Paris by the collectors above named, from the island of Bourbon, must have been much later, and perhaps also posterior to the publication of Schkuhr's work in 1806.

The specimens figured are,—

Tab. CCCVI. The lower and

Tab. CCCVII. the upper portion of a specimen from the island of Bourbon (Richard). In Tab. CCCVII. at  $v \times \times \times$  is a branch of the panicle with 3 spiculæ, the lateral ones with a solitary female floret. The separate spicula on the right is more enlarged, showing a bract, and the spathella open to the base bearing a pistil, clearly indicating the nature of the spathella, which in these paniculate species is either sterile (an axis only issuing from it), or bearing a normal floret, or a pistil, or stamens only.

Tab. CCCVIII. A partial spike much enlarged, with separate spiculæ, with one or more female florets, or entirely male, the spathellæ either sterile, or with a normal floret or a pistil only.

1. A spicula seen in a front and back view, entirely male, the spathella sterile.

2. A spicula seen in a back and front view, with a solitary female floret in the form of a pistil only issuing from the spathella.

3. The same as No. 2, the spathella removed to show the pistil.

4. A spicula with a solitary female floret, sterile spathella, and bract.



5. The same as No. 4, seen from within, removed from the axis and bract, showing, as in Nos. 1 and 2, the bicarinate spathella.

6. A lateral branch of the spike, with 3 spiculæ; terminal one normal, *without* spathella, lateral ones male, with sterile spathella.

Tab. CCCIX. *β. minor*. A specimen from the island of Bourbon (*Bernier*), with a simpler inflorescence.

The perigynia are represented as punctulate,—a character I have not observed, and I suspect the base of the setæ gave M. Maubert the idea of it. In what I consider as the true *C. ramosa* of Schkuhr, from the Mauritius, the perigynia, both in specimens from Petit-Thouars, and from Bojer in Herb. Hooker, have distinct, resinous, ferruginous spots.

In this remarkable group the general direction of the perigynium varies in the same spicula, being erect or slightly oblique at top, and gradually more and more excurved towards the base of the spicula. The excurved form, however, varies in degree in different species. It is a very striking character, from the early development of the perigynium in *C. filicina*, Nees.

250. *C. cryptostachys* (Brongniart); spica plus minus elongata lineari viridi demum olivaceo-ferruginea, e spiculis 8–10 vel pluribus oblongis linearibus apice masculis erectis exserte pedunculatis in racemis radicalibus aphyllis simplicibus vel deorsum compositis alternatim dispositis; bracteis vaginatis subulato-brachyphyllis; stigmatibus 3, brevibus; perigyniis oblongis vel oblongo-obovatis stipitatis compresso-biconvexis rostellatis, ore subobliquo bidentato, crebre striato-nervosis superne scabris marginibus ciliatis, squama subrotunda ovata obtusa mutica vel abrupte apiculata mucronata plus minus vaginato-

amplectente longioribus.—*C. cryptostachys*, *Brongn. Voy. de la Coquille, Duperry, t. 25; Kunth, 513.* (TAB. CCCX.)

HAB. In India orientali. China. Penang, *Wallich, n. 3383*. Offack, Ins. Waigiou, N. Guinea, *Durville*. Touran, Cochin China, *Gaudichaud (Herb. Mus. Paris)*. Java, *Zollinger (Herb. Mus. Paris)*. Hongkong, *Wright*. U. S. Pac. Exped., *Dr. Harland*.

*Culmi* 6–12-poll., plures ex eadem radice, aphylli, fere e basi spiculiferi, graciles. *Folia* 3–5 lin. lata, culmos longe superantia, plana, apice longe attenuata, striato-nervosa, rigida. *Bracteæ* vaginatæ, subulatæ, spiculis breviores. *Vaginæ* 3–12 lin. longæ, intus scabriuseulæ. *Spica* 6–10 poll. longa, in eadem planta simplex vel basi e ramis plus minus longis composita. *Spiculæ* 3–14 lin. longæ,  $1\frac{1}{2}$  lin. latæ, apice inconspicua masculæ. *Squamæ* subinde plus minus vaginantes. *Perigynium* (eum stipite  $\frac{3}{10}$  lin. longo)  $1\frac{8}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum. *Achenium* (eum stipite calloso tumido aurantiaco  $\frac{2}{10}$  lin. longo)  $1\frac{1}{10}$  lin. longum,  $\frac{7}{10}$  lin. latum, depressionibus undique distortum, fuscum; basi styli deorsum recurvata, æquali.

This remarkable species, originally found by Dr. Wallich at Penang, was not noticed till Brongniart described and figured it among the plants collected in the voyage of the 'Coquille.' I am indebted to M. Spach for the knowledge of its having been found in Java and Cochin China, and to Dr. Gray and Mr. Bentham for its being a native of Hongkong. It belongs to the *Dactylo-stachyæ* of Drejer.

THE END.









C. CRUENTA.









C. CRUENTA, A & B. (2)









C. CRUENTA. B.









C. KOSTLINI.









C. KOSTLINI.









C. KÖSTLINI. B.









C. KOSTLINI, B.







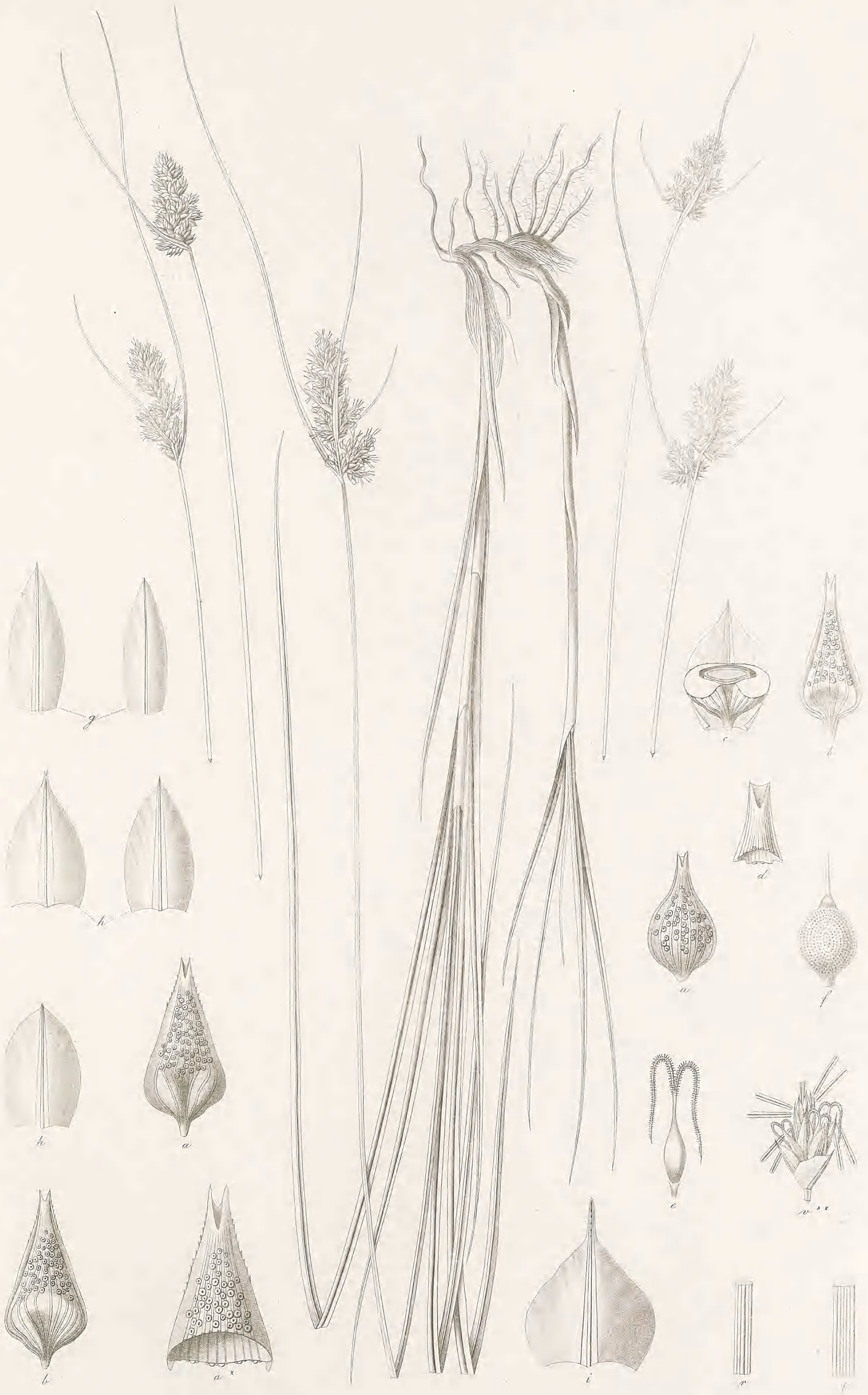


C. CONFERTA.







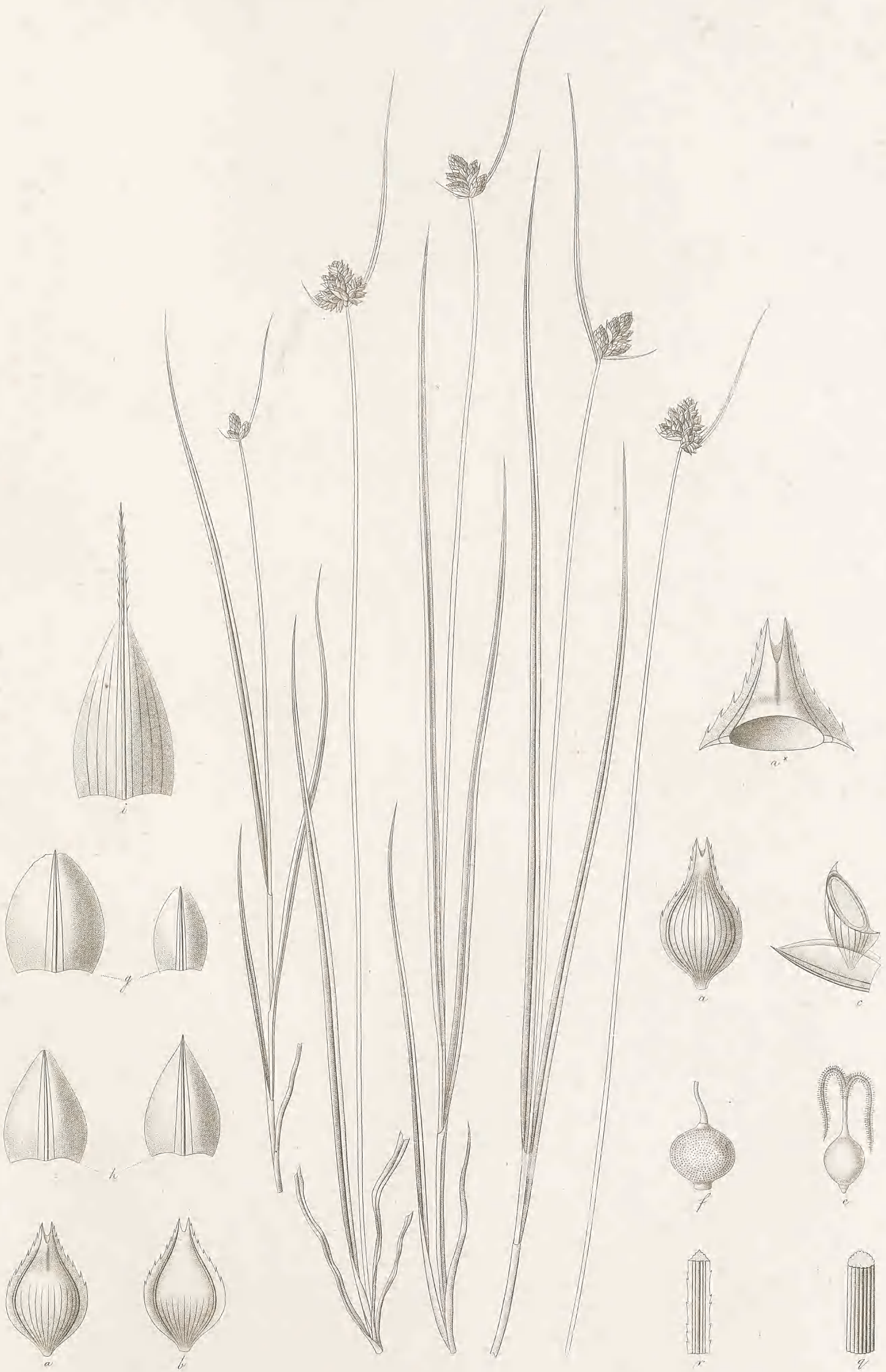


C. BONARIENSIS.









C. INVOLUCRATA.









C. FRANKLINII.









C. FULIGINOSA.







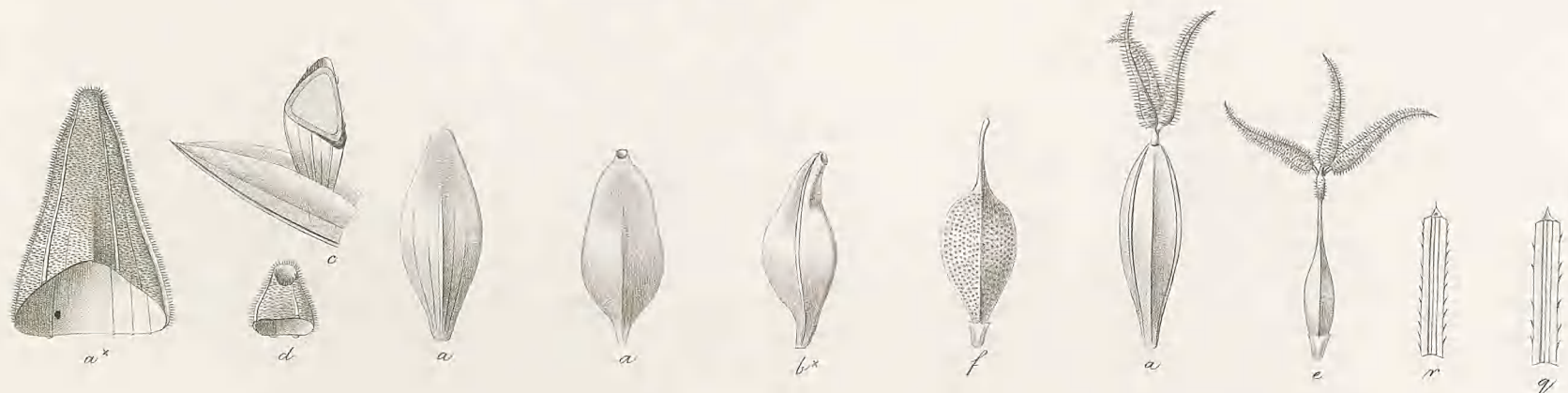
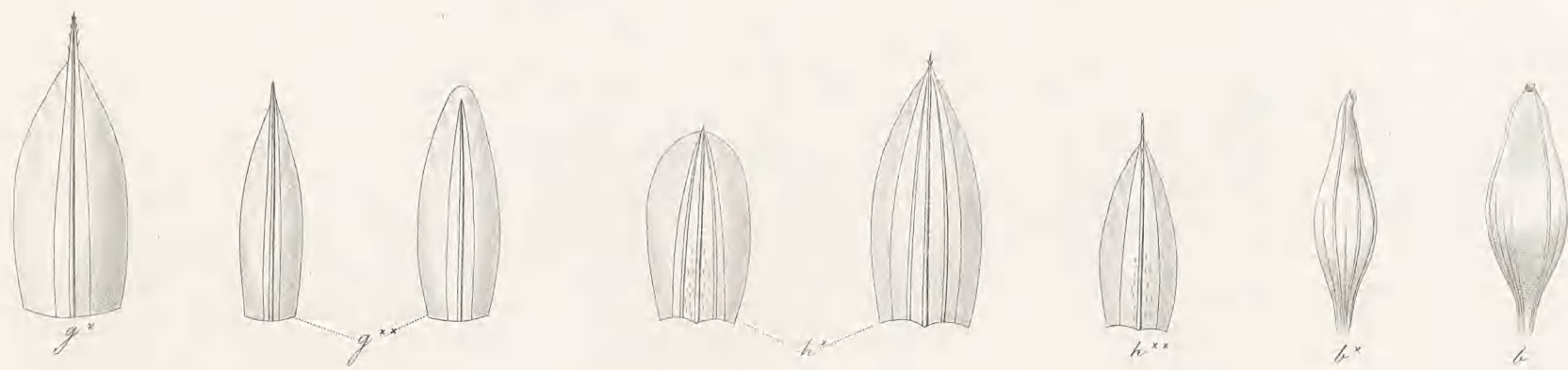


C. LAXA.









C. LIVIDA.









C. LIVIDA.







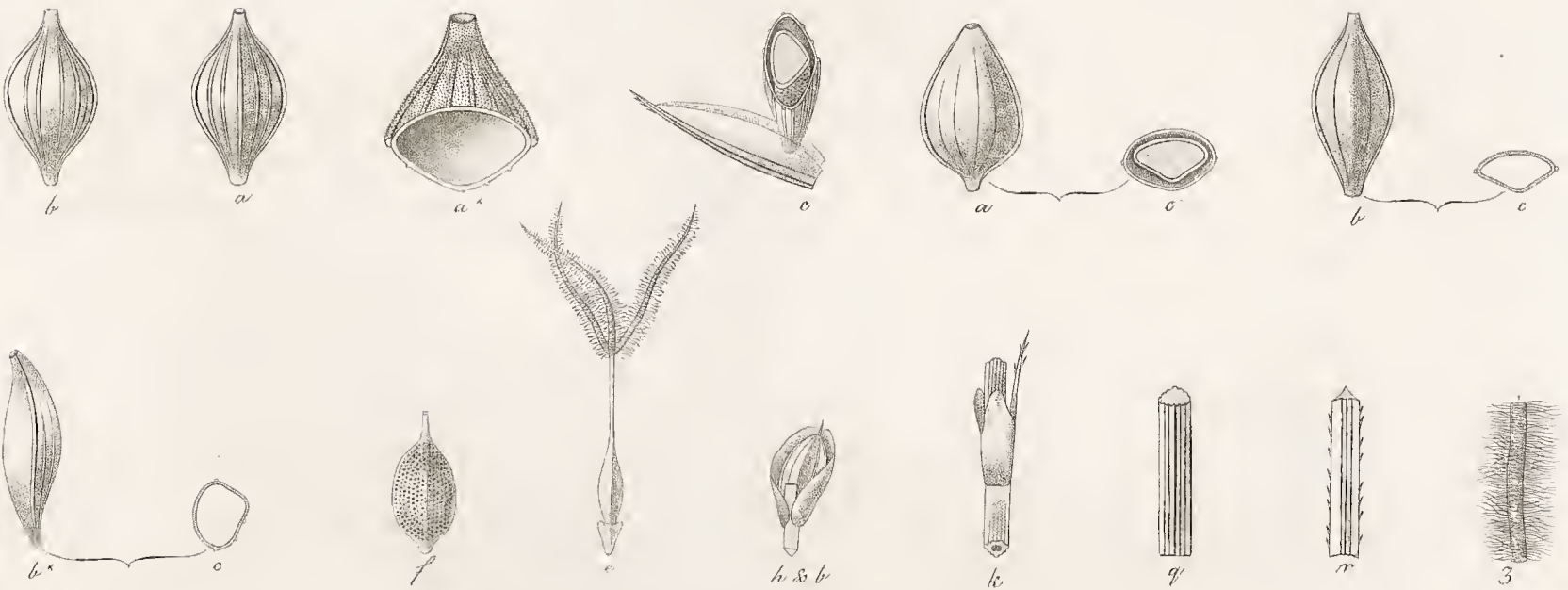
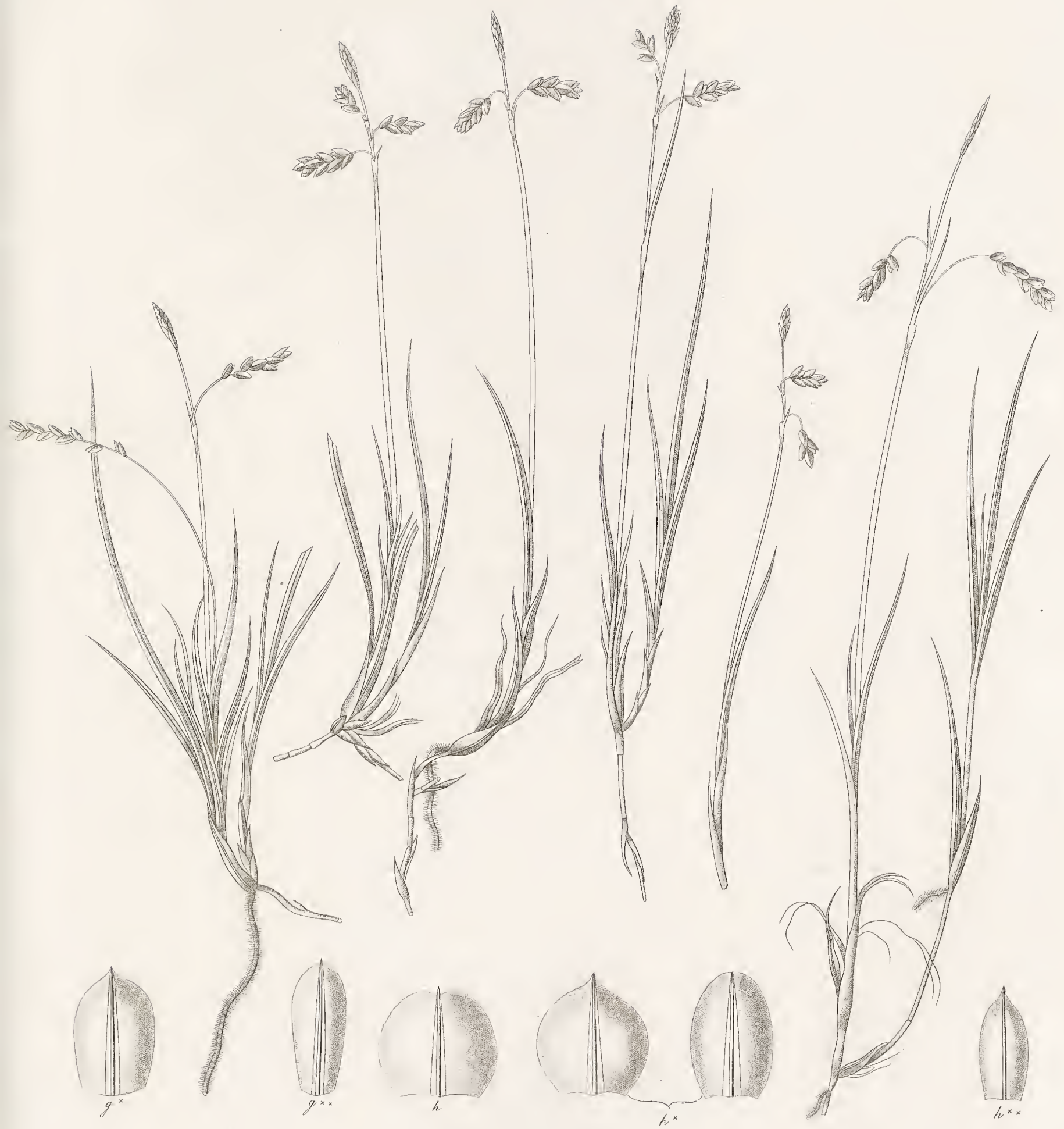


C. LIMOSA.









C. RARIFLORA.









C. MAGELLANICA.  
(Fuegia)









*C. MAGELLANICA.*  
(*Lapponica*)









C. MAGELLANICA.  
(Boreali Americana)









C. MONOSTACHYA.









C. GLOMERATA.







C. R O S E A.



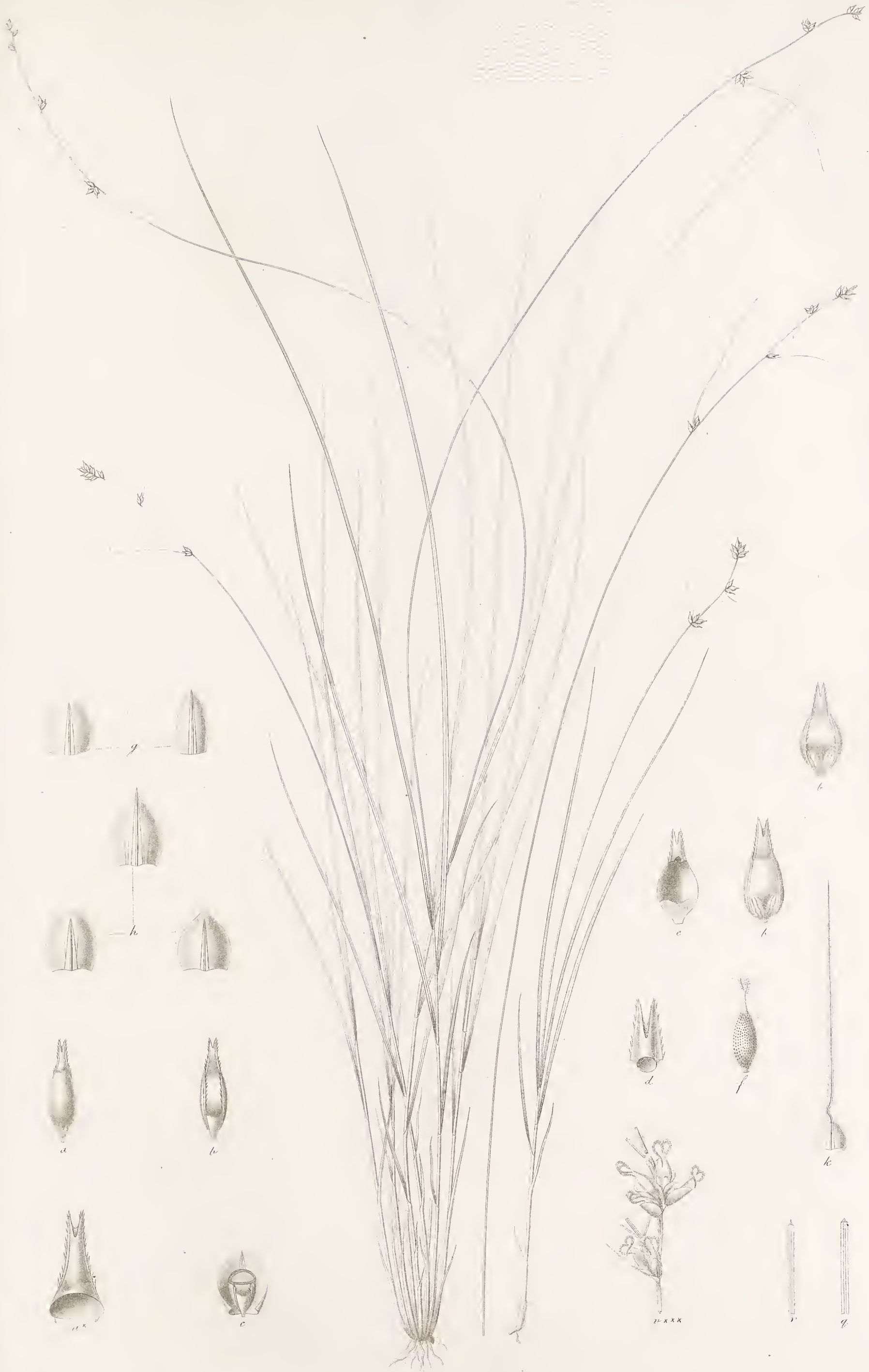




C. ROSEA B.







C. ROSEA γ.



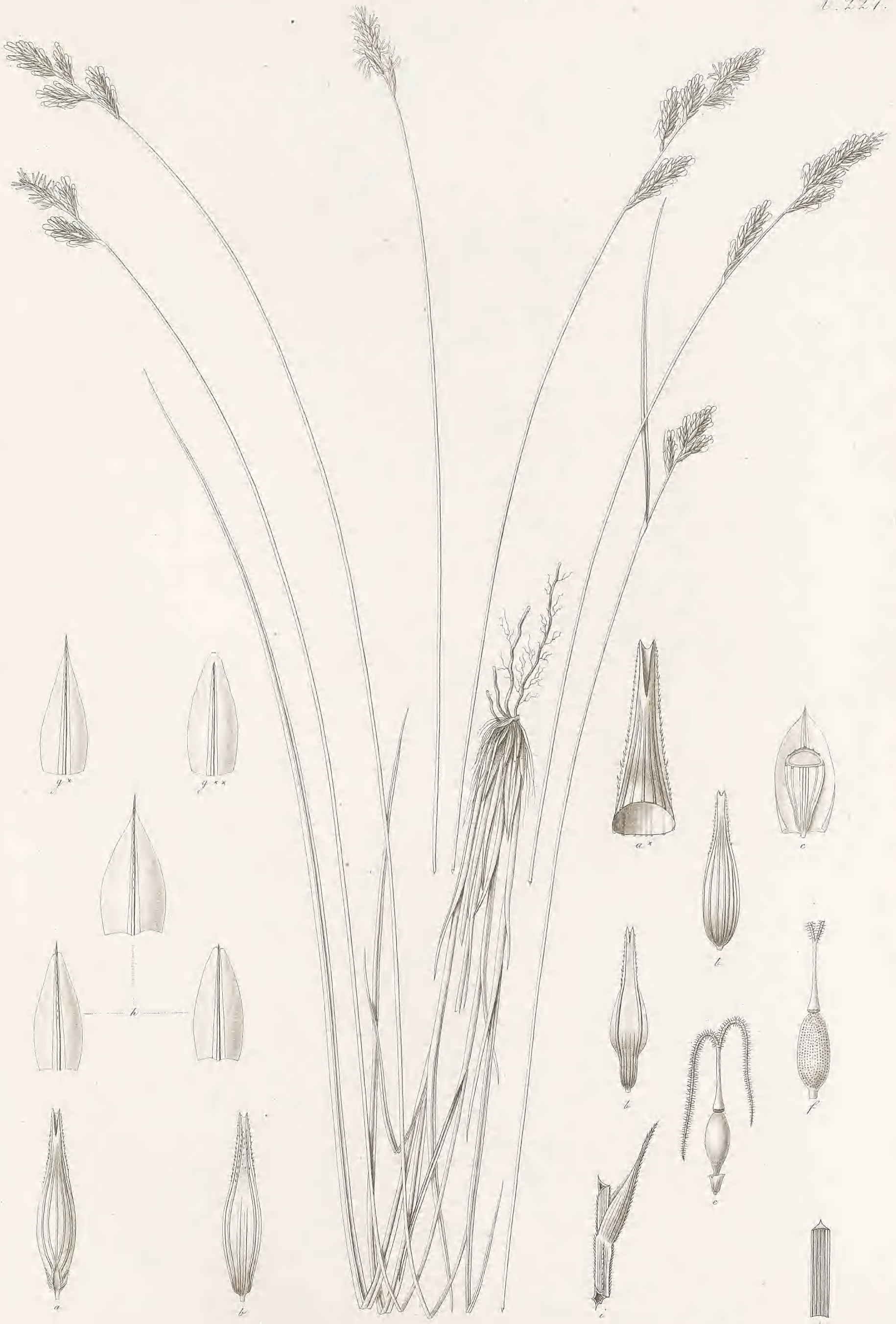




C. RETROFLEXA.







C. BROMOIDES.







C. DESPONSA.







C . MYOSURUS .







C. MYOSURUS.







C. MYOSURUS.







C. MYOSURUS.







C. MYOSURUS.







C. BACCANS.







C. BACCANS.







C. BACCANS.







C. BACCANS.







C. BACCANS.







Rees del et Lith

*C. baccans.*



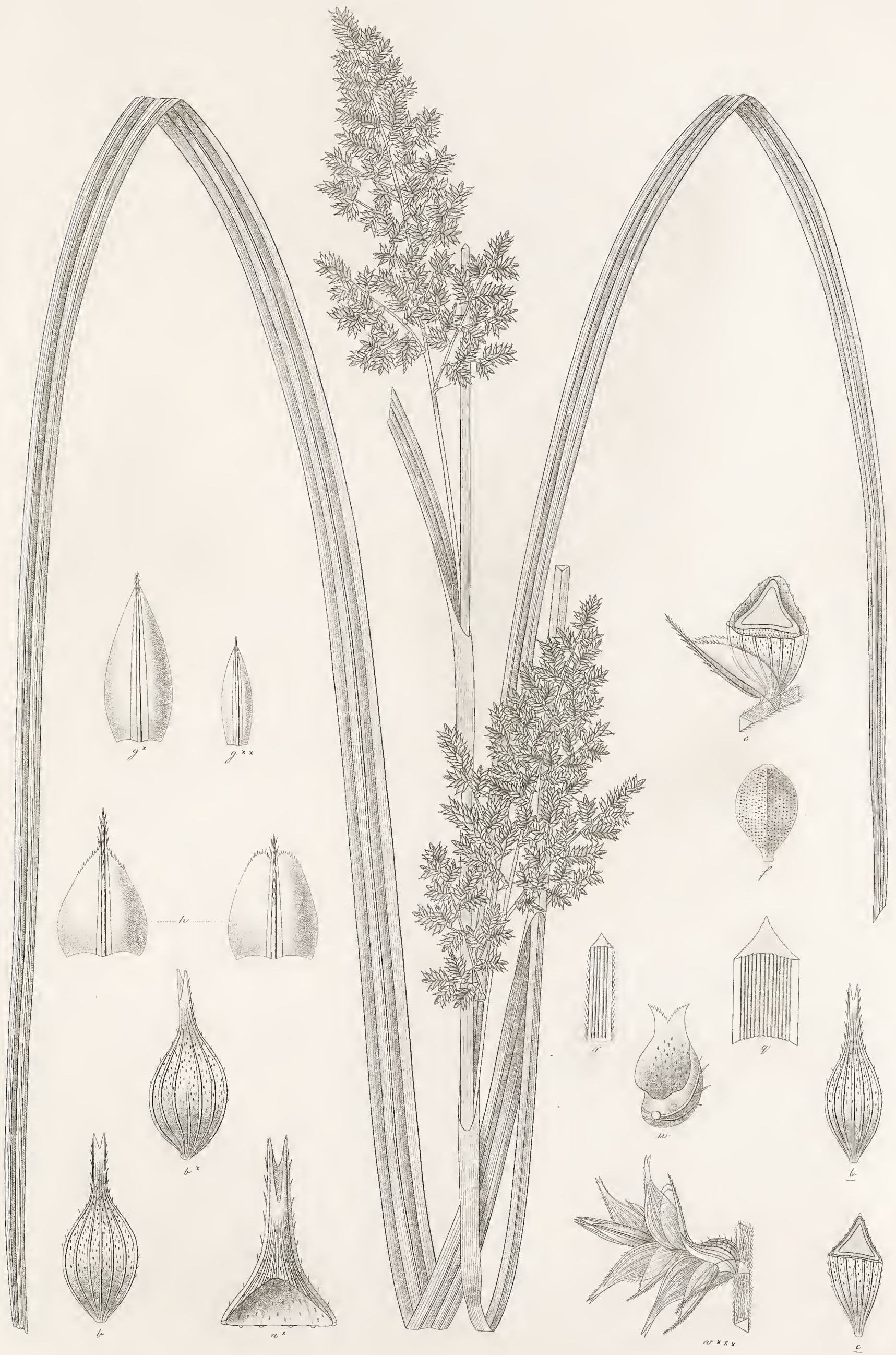




C. BENGALENSIS.







C. BENGALENSIS.







C. BENGALENSIS.







C. BENGALENSIS.







C. RAPHIDOCARPA.







C. FISSILIS.







C. SPATIOSA.





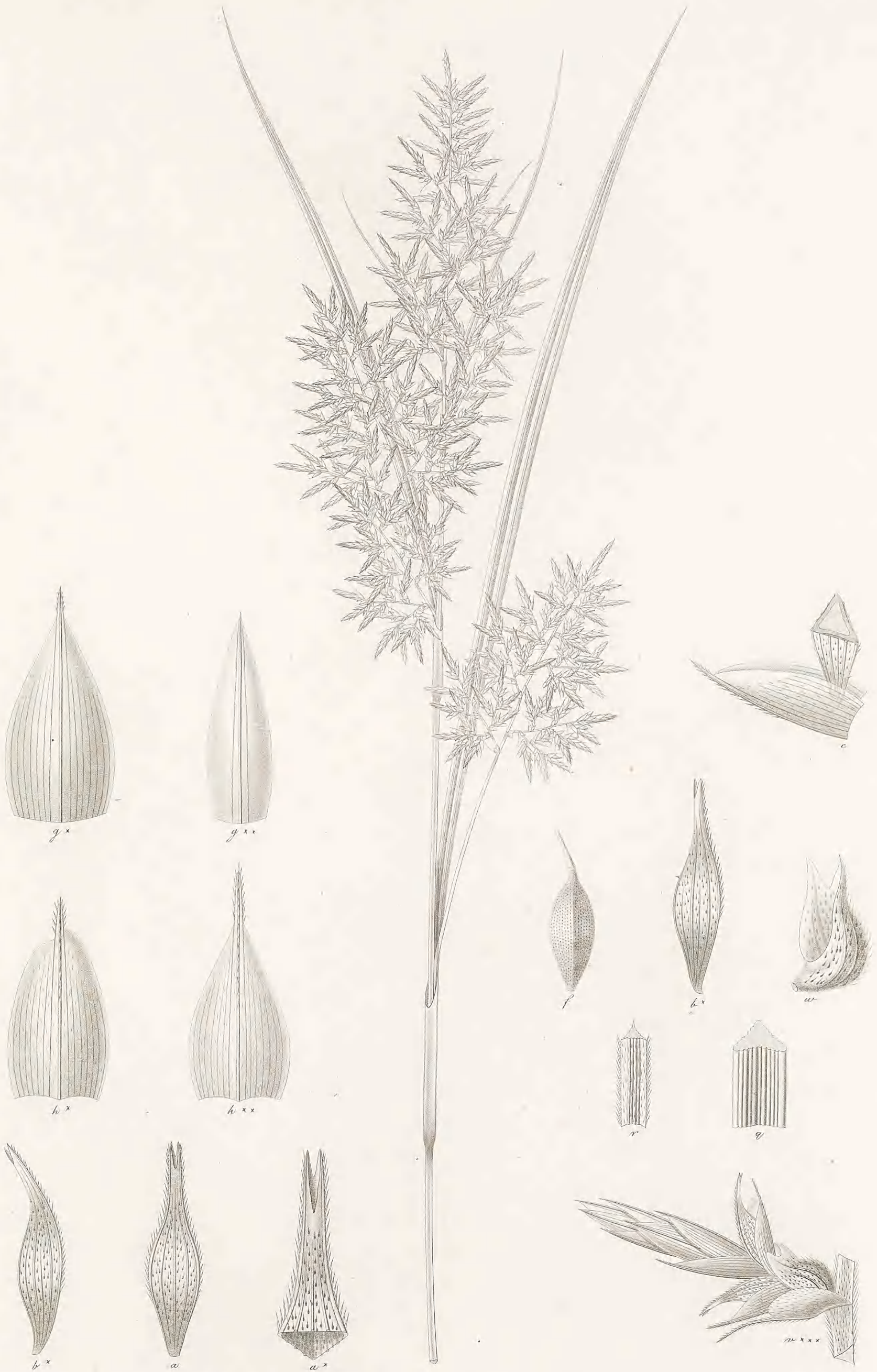




C. CONDENSATA.







C. CONDENSATA.







C. CONDENSATA B.







C. I N D I C A.







C. INDICA.







C. INDICA.







C. INDICA.







C. INDICA B.







C. HARLANDI.









C. TENEBROSA.







C. JAPONICA.









C. ALOPECUROIDES.







C. PETITIANA.







C. BRASILIENSIS.







C. GLAUDESCENS.







C. GLAUDESCENS. B.







C. GLAUDESCENS. γ.







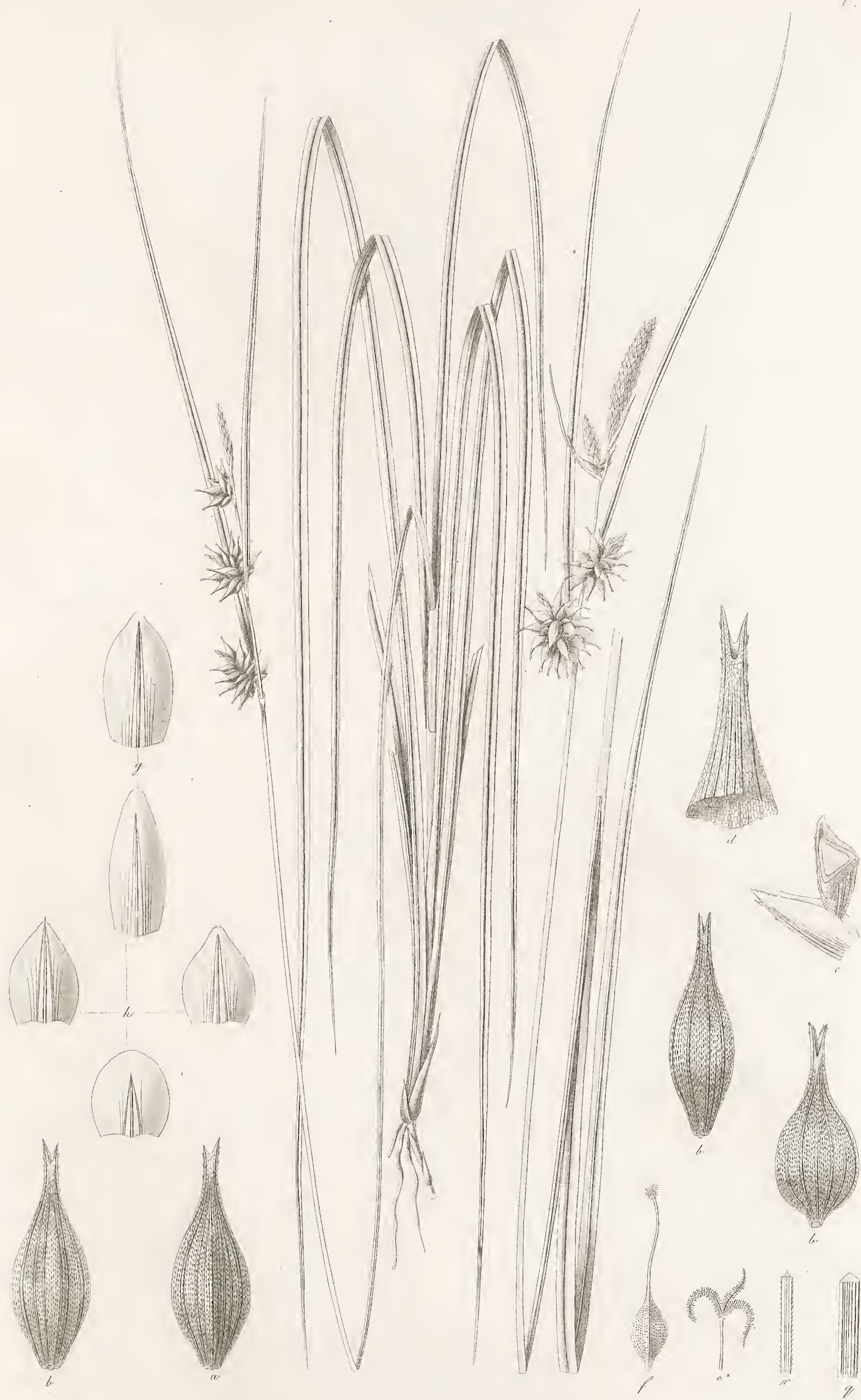
C. TURGESCENS.

M.

P.







C. ELLIOTTII.







C. SCHWEINITZII.







C. ROSTRATA



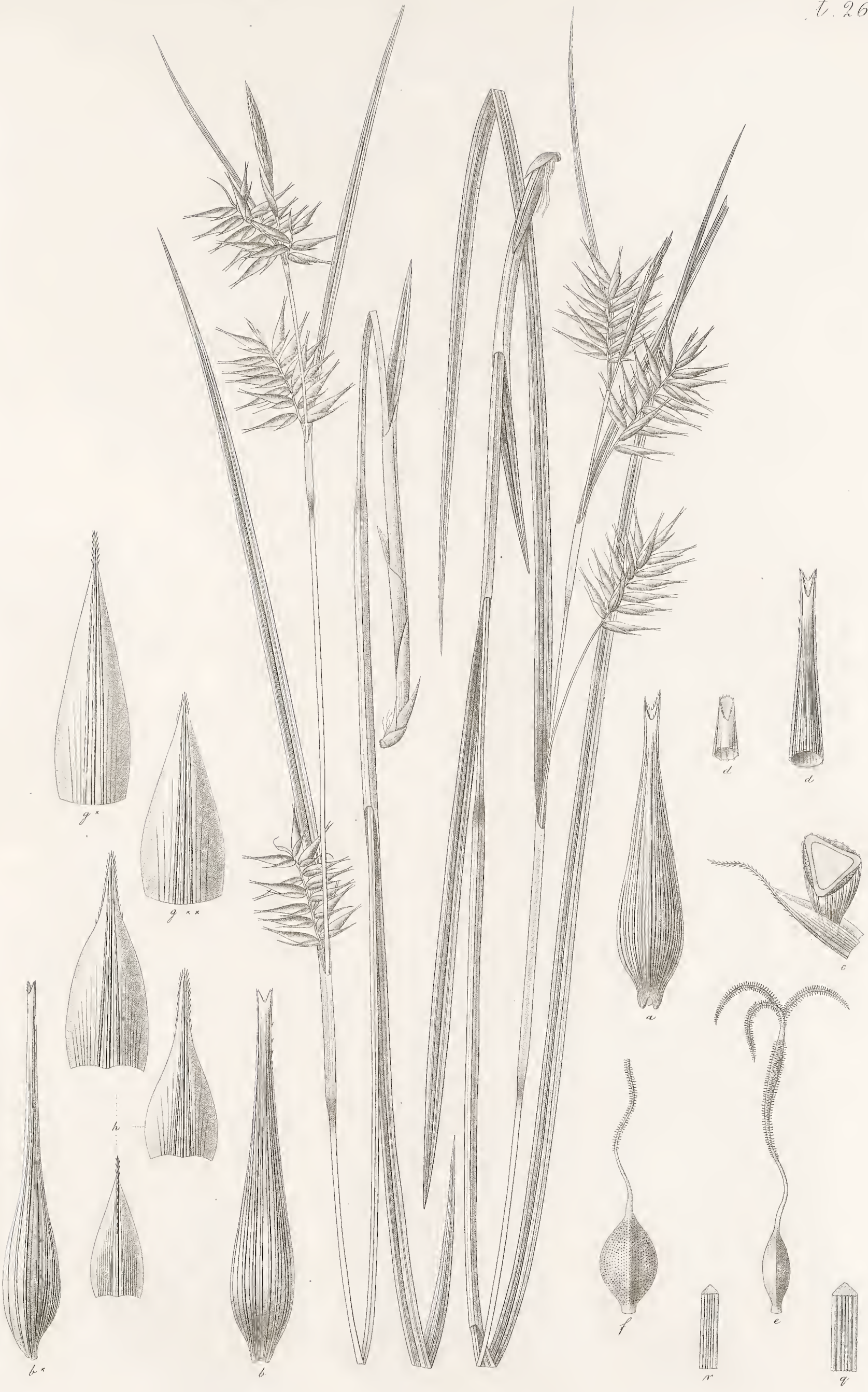




C. FOLLICULATA.



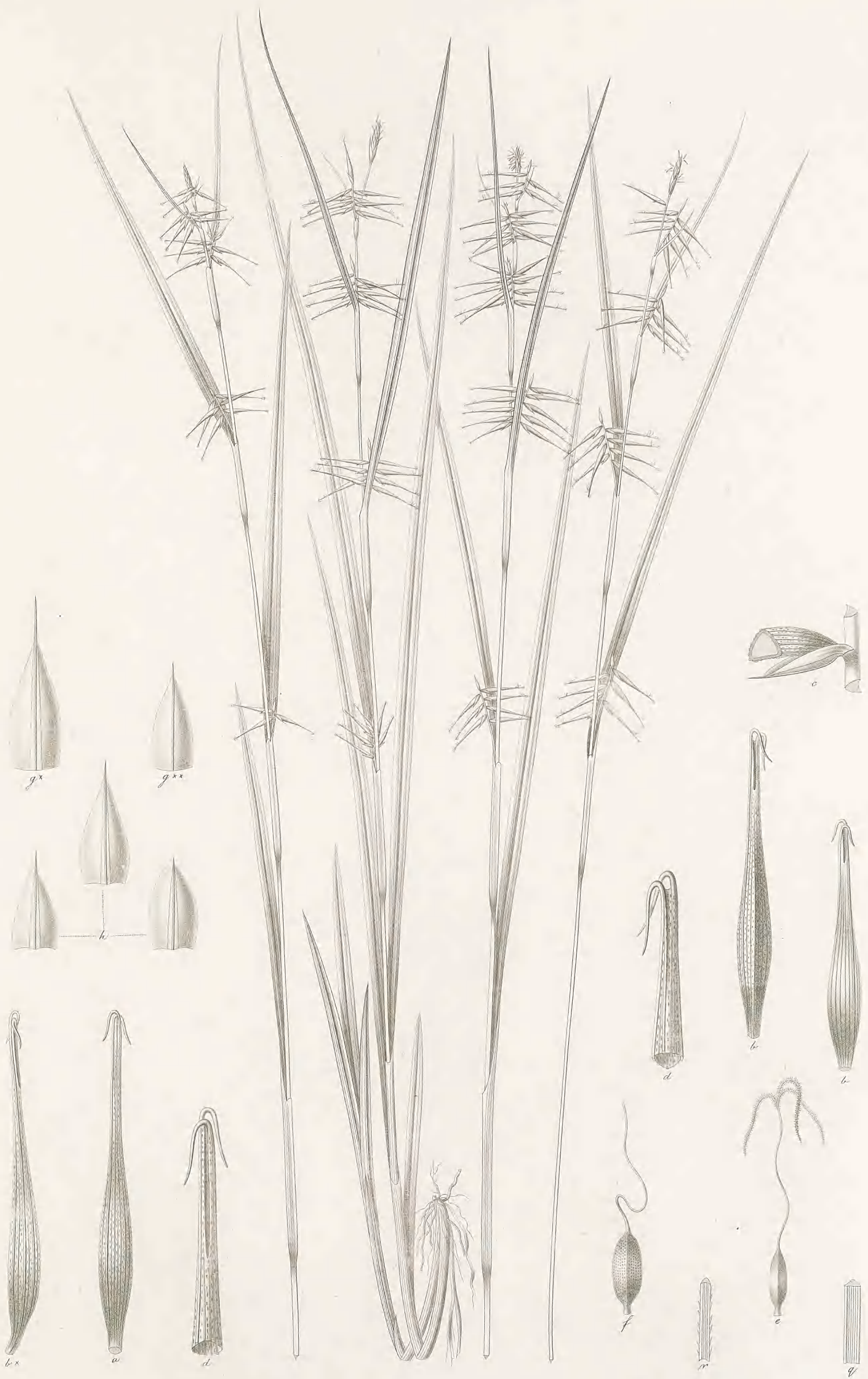




C. FOLLICULATA VAR.  $\beta$ .







C. SUBULATA.







C. SHORTIANA.







C. D E B I L I S .







C. DEBILIS β.







C DEBILIS  $\gamma$ .







C. GLABRA.







C. RETRORSA.







C. TENTACULATA.







C. TENTACULATA VAR. γ.







C. HALEI.







C. SQUARROSA.







C. SQUARROSA.



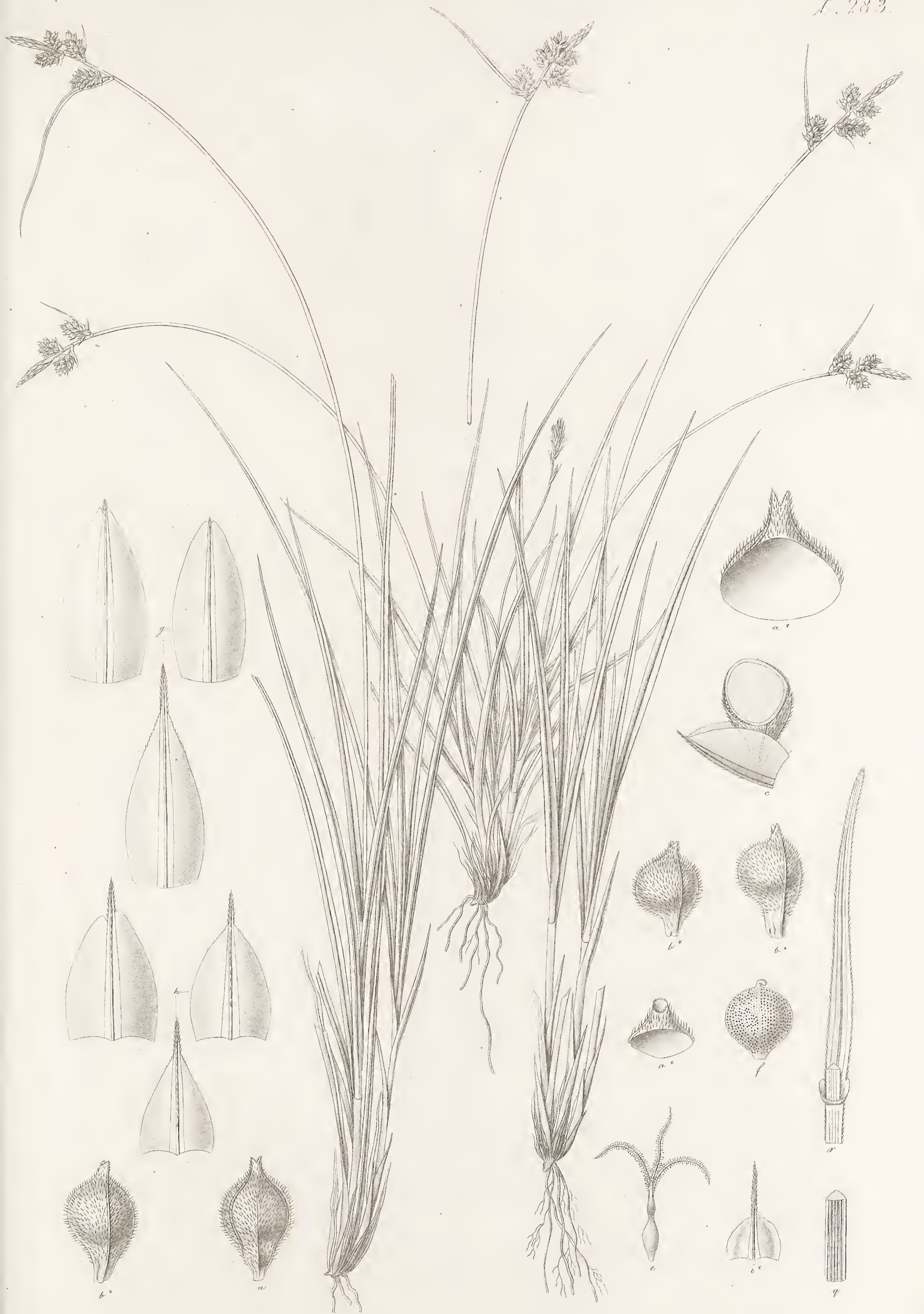




C. STENOLEPIS.



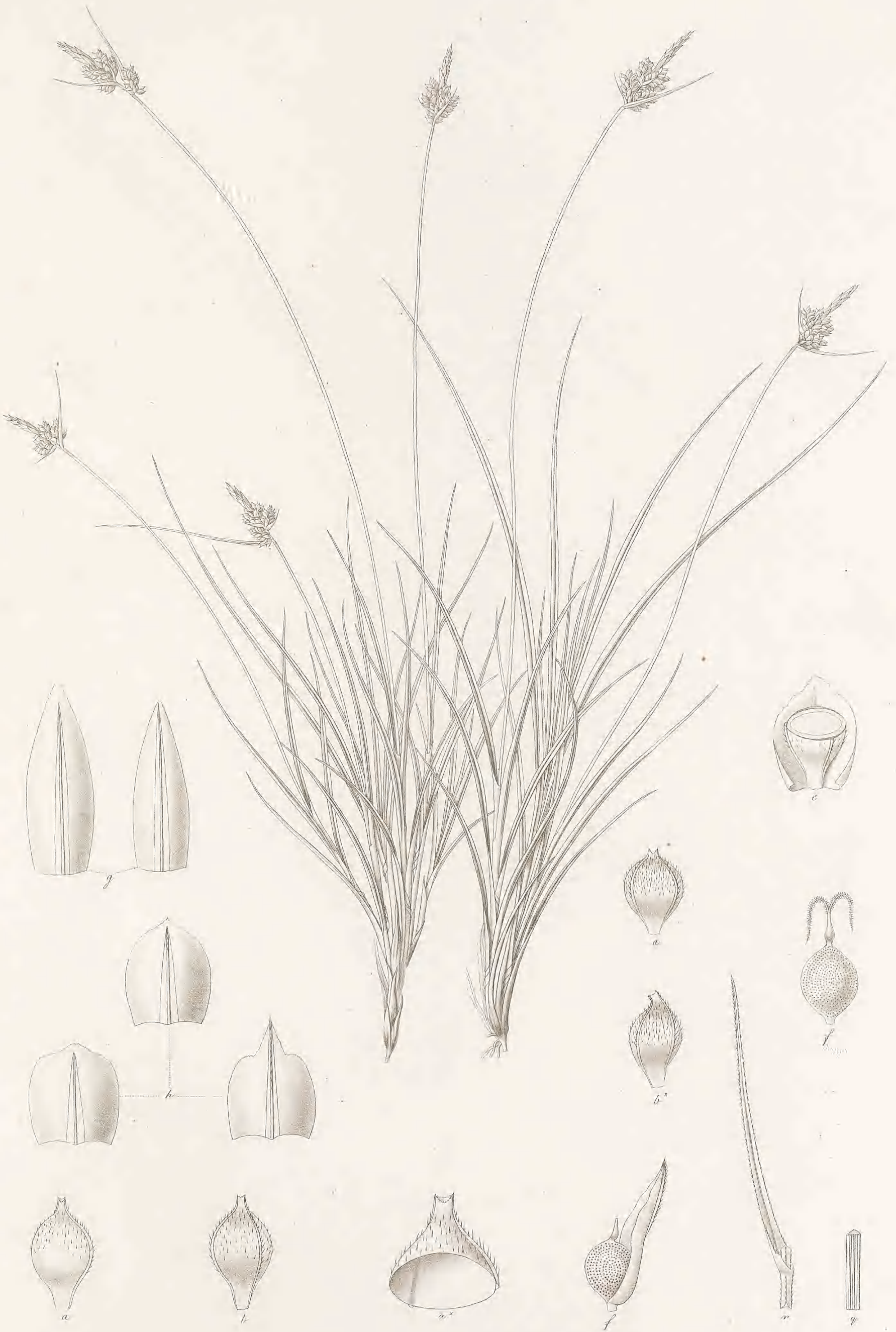




C. PILULIFERA.







C. AZORICA.



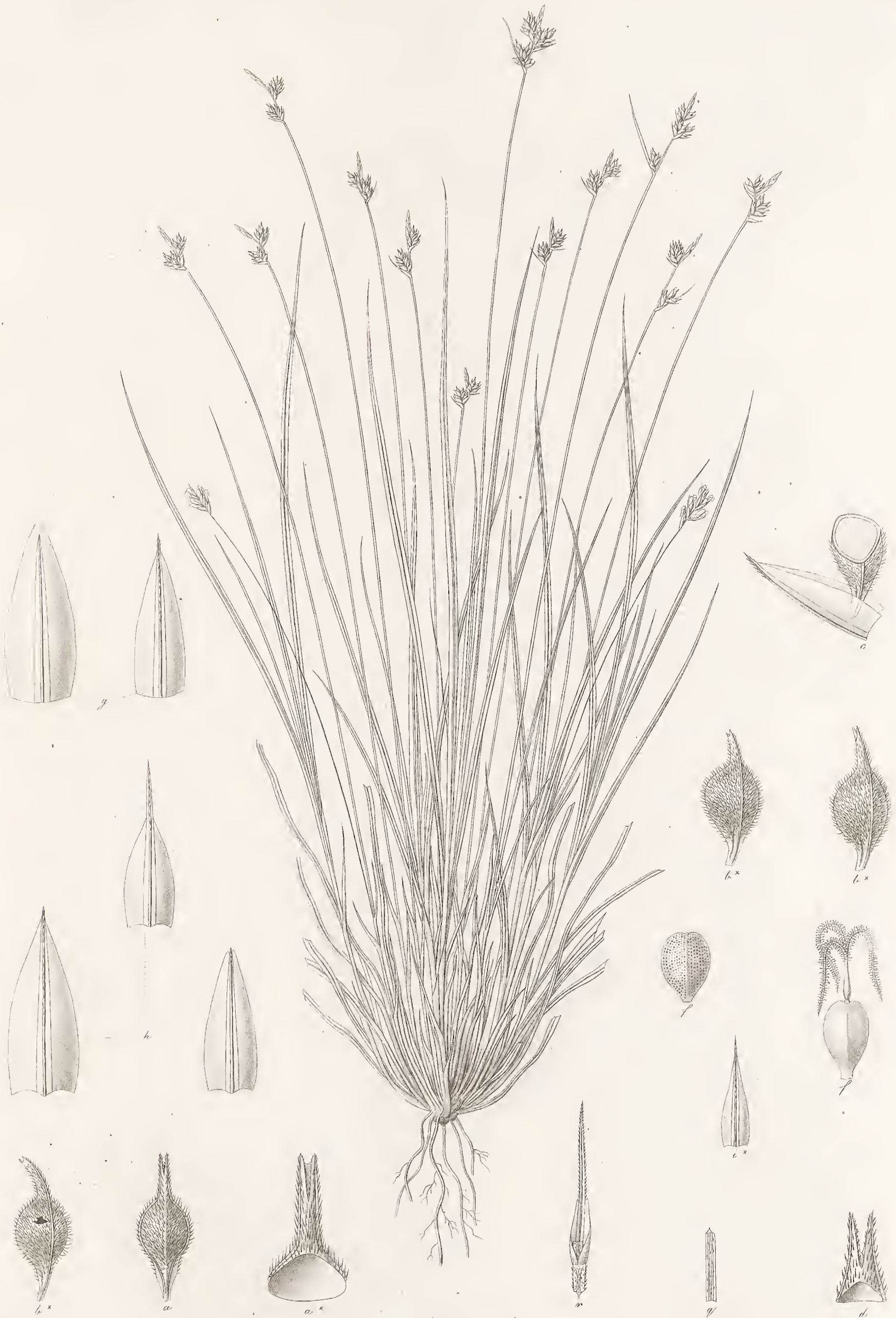




C. NOVAE ANGLIAE.



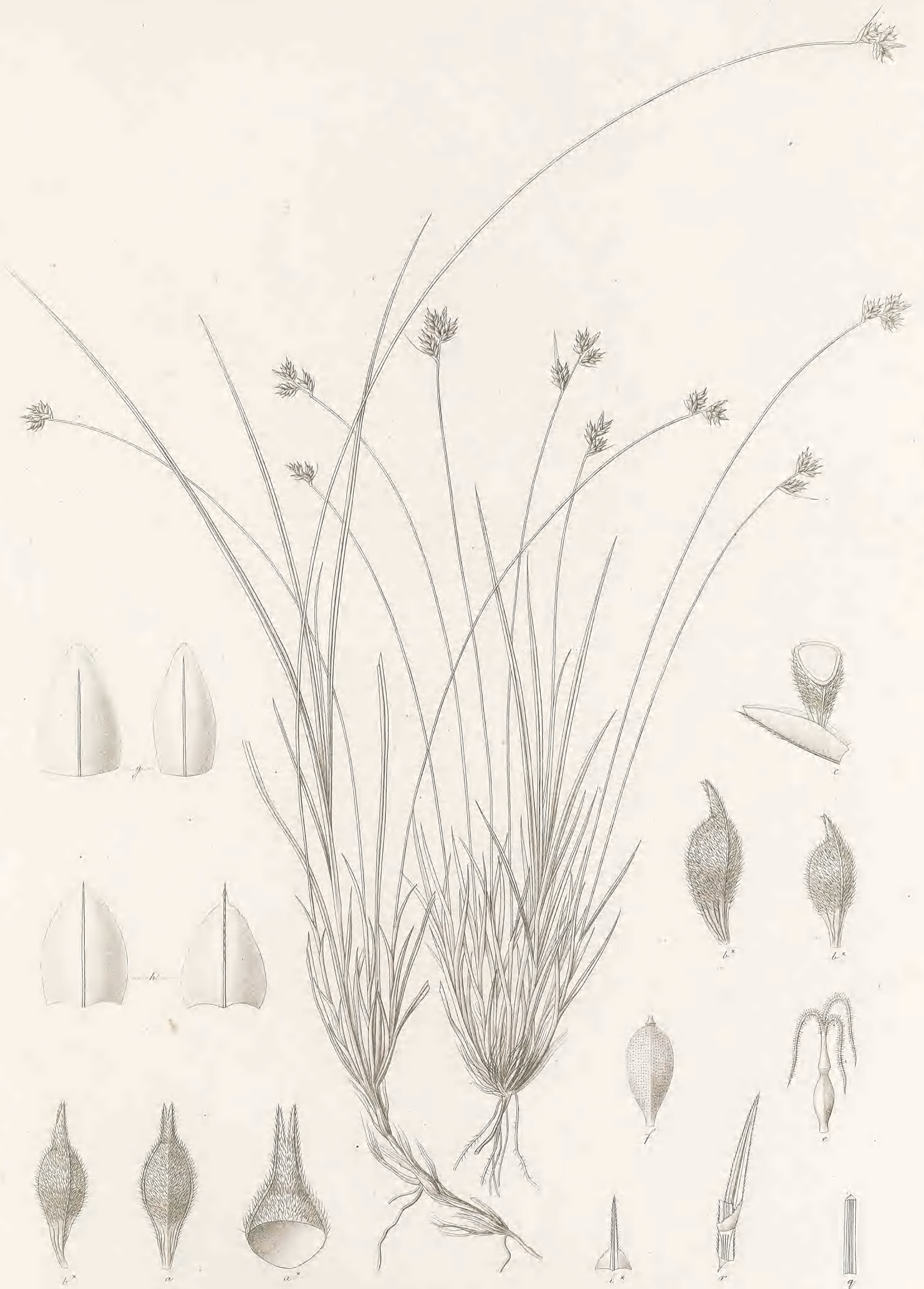




C. EMMONSII







C. EMMONSII B.



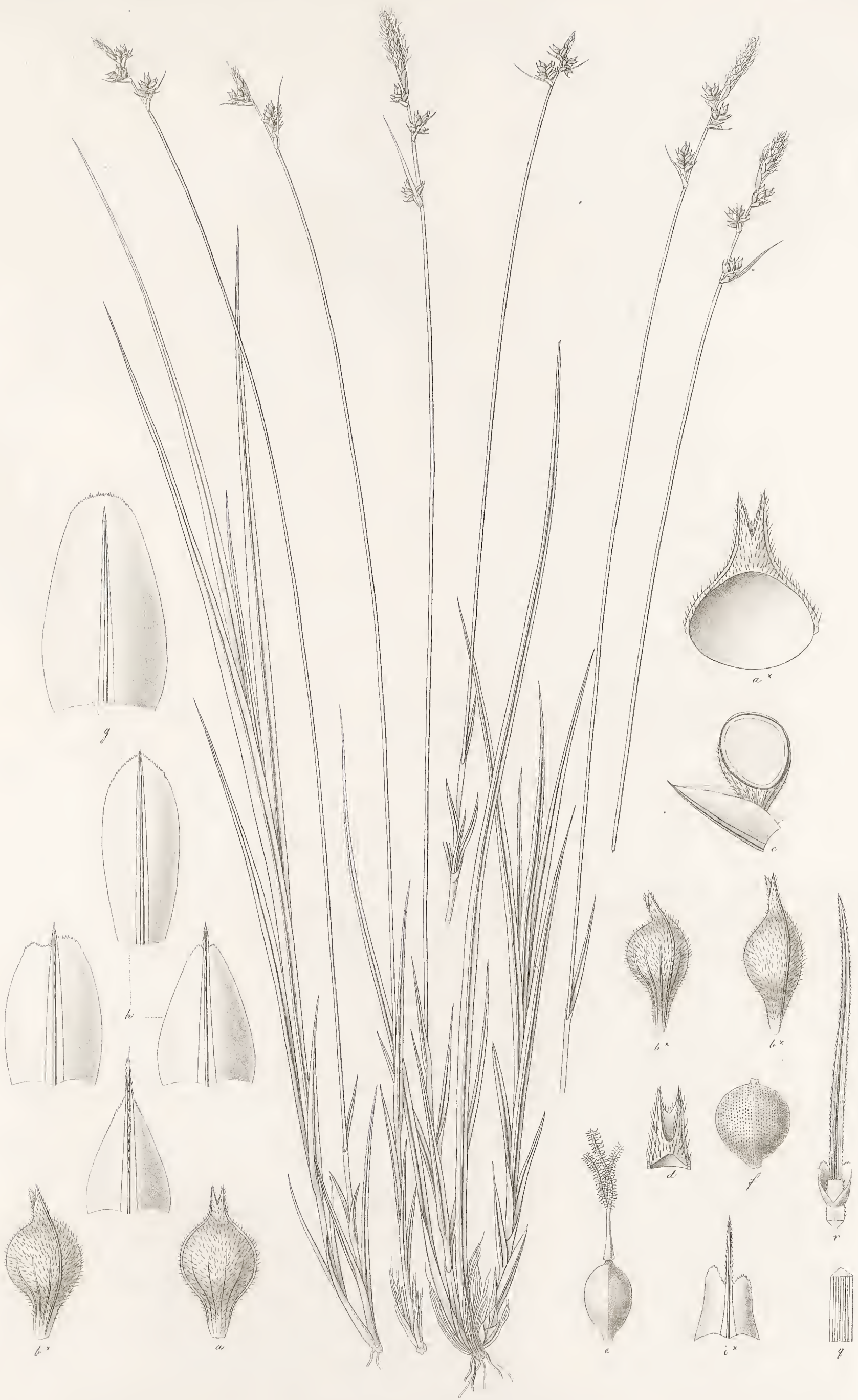




C. VARIA



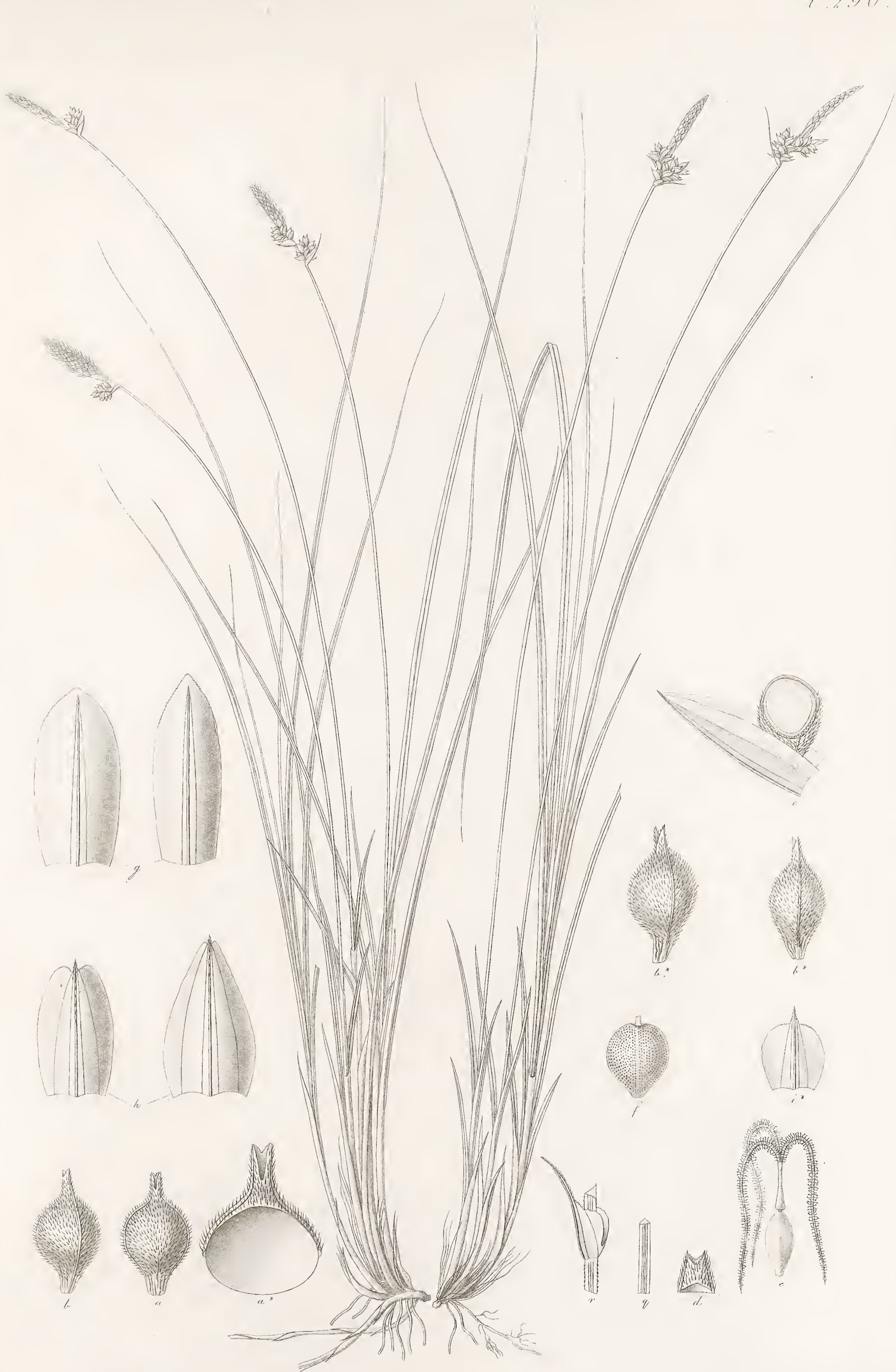




C. VARIA. B.







C. PENNSYLVANICA







C. PENNSYLVANICA.



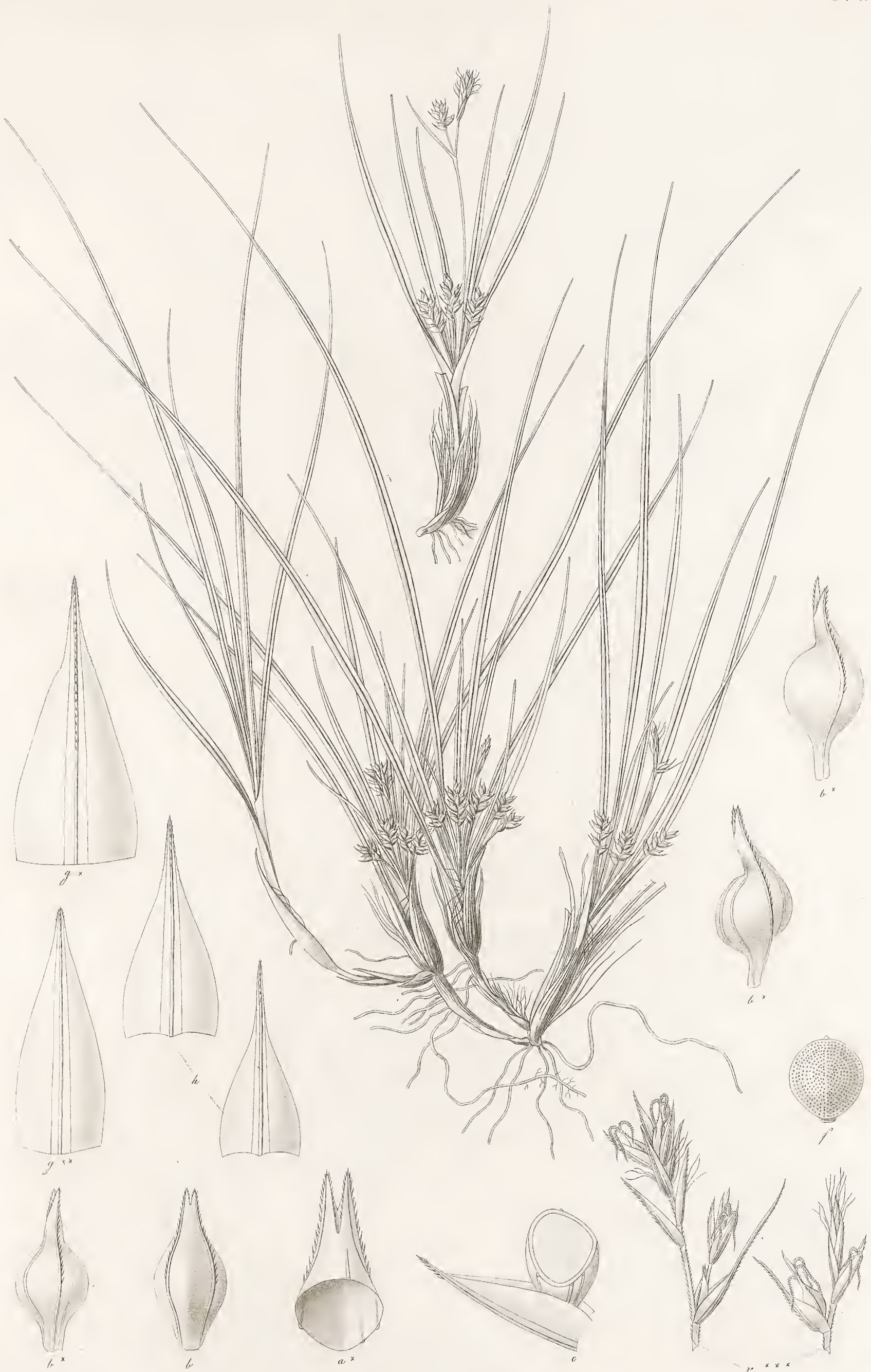




C. UMBELLATA.







C. UMBELLATA.



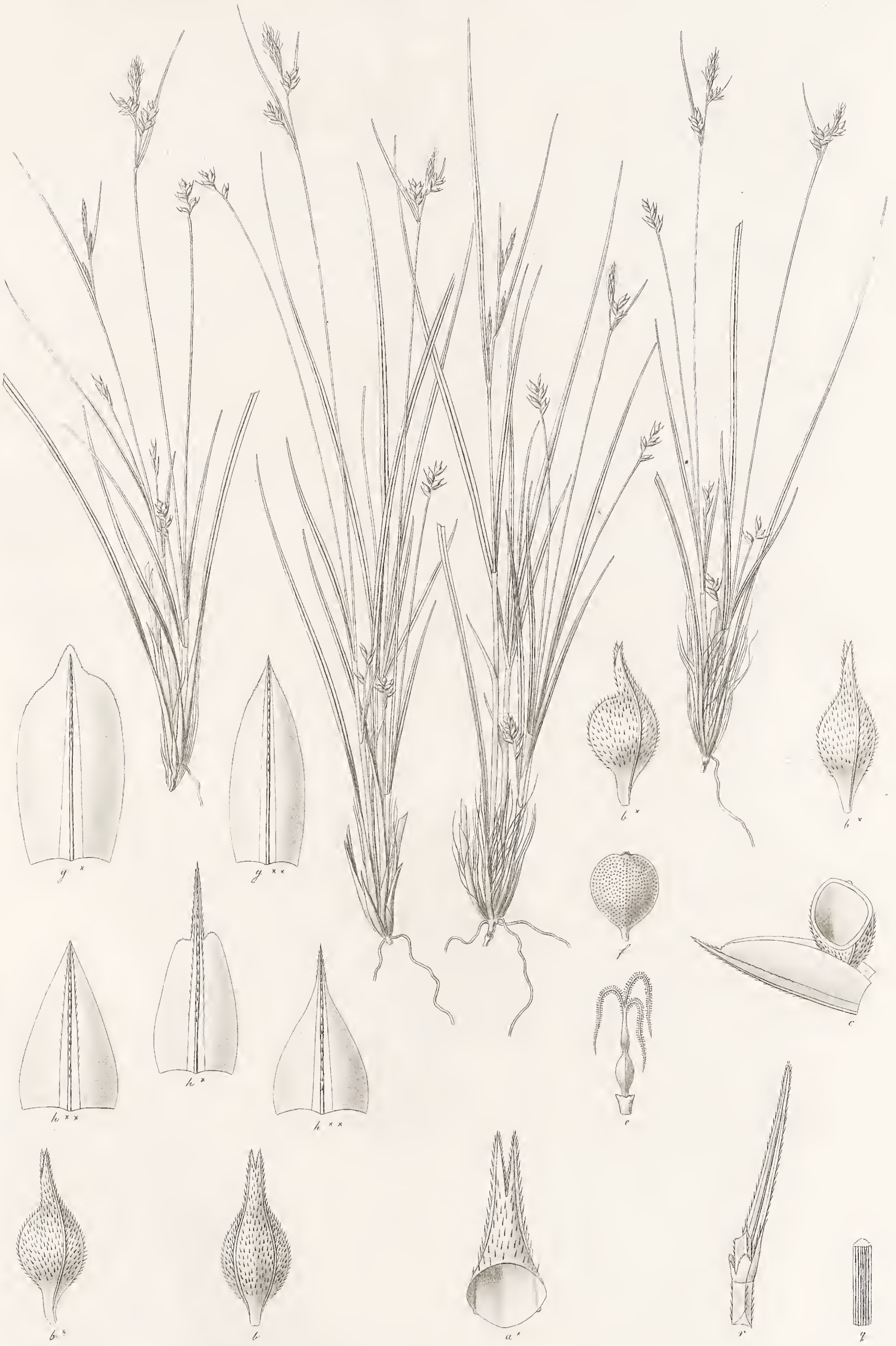




C. UMBELLATA. B.



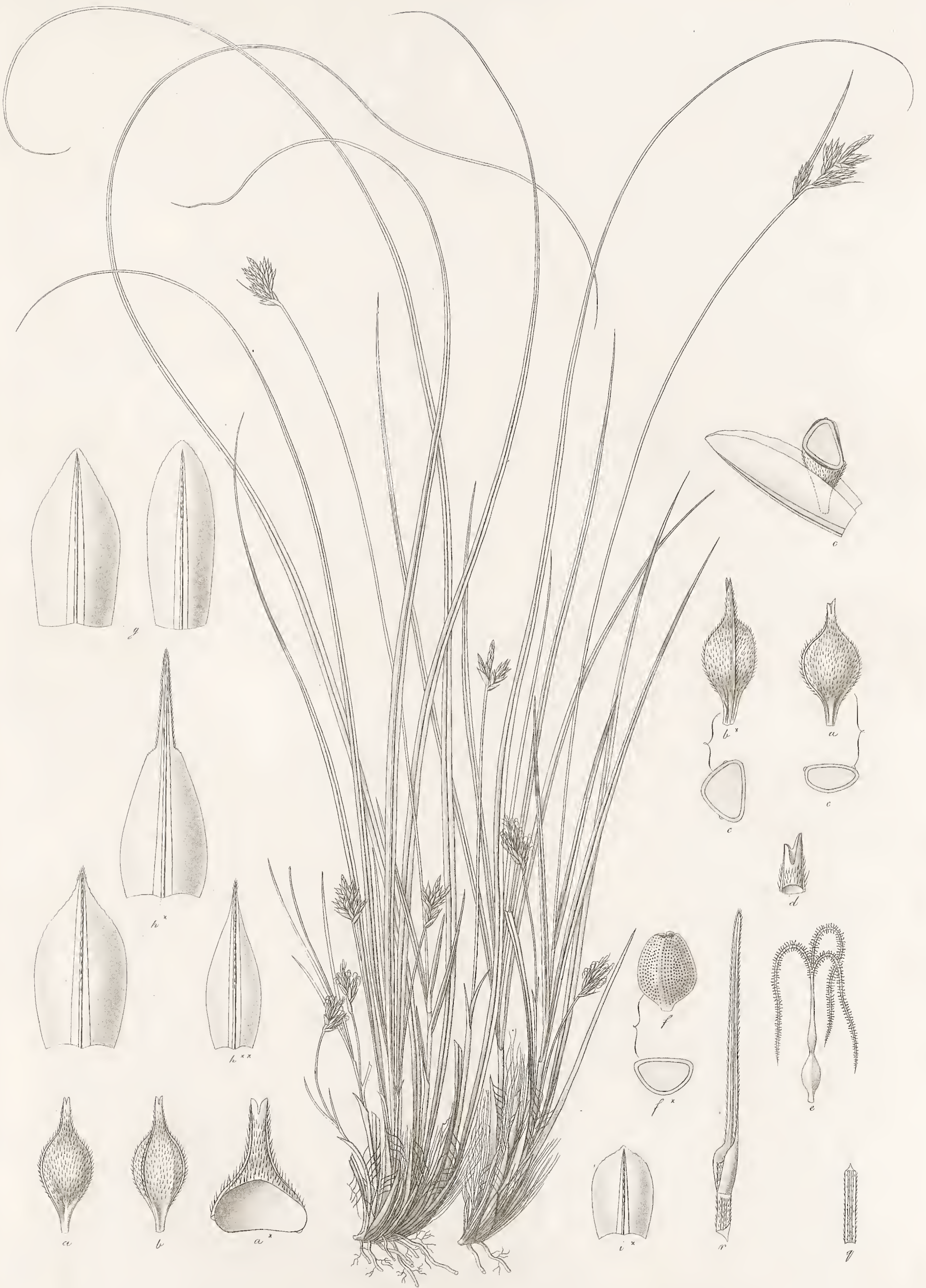




C. ROSSII.



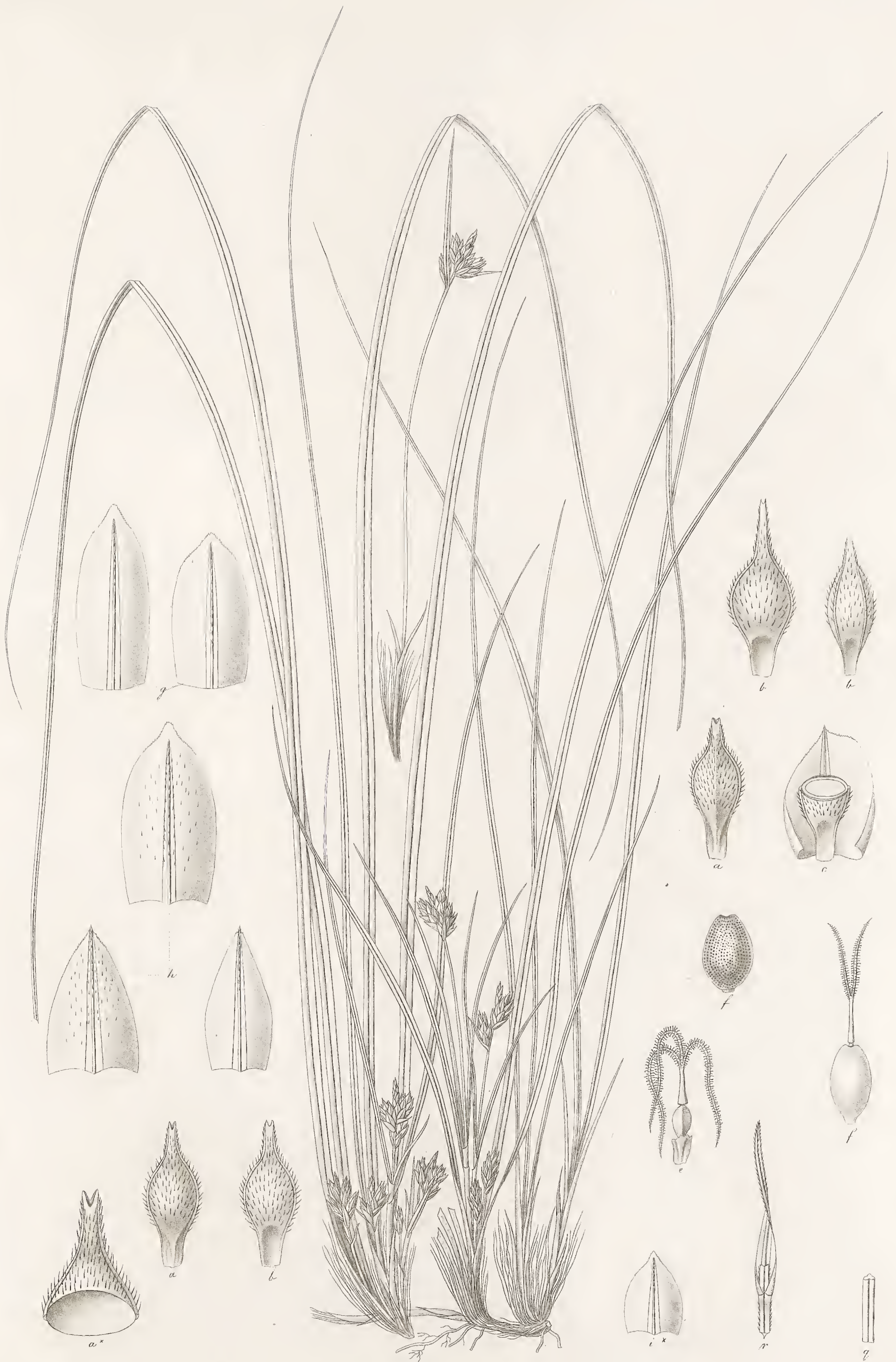




C. NIGRO-MARGINATA.







C. FLORIDANA.







C. RICHARDSONI.







C. TOLMIEI.







C. MILIACEA.







C. WAHLENBERGIANA.







C. WAHLENBERGIANA VAR. B.







C. WAHLENBERGIANA VAR. Y.







C. WAHLENBERGIANA VAR. ♂.







C. WAHLENBERGIANA VAR.  $\epsilon$ .







C. CRINIGERA.









C. CRINIGERA.









C. CRINIGERA.







C. CRINIGERA B.







C. CRYPTOSTACHYS.

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